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Increasing Prospective Teachers' Skills in Detection of Ensemble Performance-Deficiencies by Means of Recorded Musical Materials.

Robert Weatherly
Louisiana State University and Agricultural & Mechanical College

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INCREASING PROSPECTIVE TEACHERS' SKILLS IN DETECTION OF ENSEMBLE PERFORMANCE-DEFICIENCIES BY MEANS OF RECORDED MUSICAL MATERIALS

A Dissertation

Submitted to the Graduate Faculty of the
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in

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by
Robert Weatherly
Diploma, Juilliard School of Music, 1943
B.Mus.Ed., St. Louis Institute of Music, 1960
M.A. in Ed., Washington University, 1961
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ABSTRACT

The purpose of this study was to determine whether a statistically significant difference could be observed in the ability of a group of music-teachers-in-training to detect and identify performance deficiencies associated with three types of distortions of vertical linearity as a function of an experimental treatment devised for the study, as compared with the treatment (the traditional curriculum) to which a control group was confined. The pretest-posttest control group experimental design was used.

The sample consisted of the 47 music-teacher-in-training members of the Southeastern Louisiana University Symphonic Band during the fall semester of the 1970-1971 academic year. The entire group was equated on the basis of year-in-school, sex, and ACT percentile scores, then randomly assigned to either the control group or experimental group. All of the members were required to participate; no mortality was experienced.

The treatment for the experimental group consisted of an "instructional unit" devised for the occasion by the writer. The unit was taught verbally by the writer over a period of five one-hour regular class meetings, utilizing 100 excerpts from musical recordings (86 percent of professional groups, 14 percent of advanced student groups) which

demonstrated, in his professional judgment, distortions of vertical linearity of three types: a momentary distortion, a distortion due to deficiencies of attack and release, and a more extended distortion resulting in two or more disparate tempos, and an abrupt and unmotivated change in tempo. A limited amount of musical context surrounded each deficiency.

During simultaneous sessions, the control group received a placebo-type treatment under the direction of a graduate assistant who restricted his participation to reading aloud the verbatim instructions of the writer to the control group. The treatment consisted of listening to musical recordings for the five one-hour class meetings, writing any comments they deemed appropriate about each composition. All responses were reviewed by the writer. The rationale for this treatment was to allow the control group to demonstrate on the pretest-posttest the results of the traditional instruction presented by the University on the skills under consideration. The traditional curriculum at the University does not treat these skills in any direct, organized fashion; rather, many course-offerings in the curriculum are relied upon to impart these skills to the students.

The pretest-posttest consisted of 50 items and was constructed from a pool of 150 such recorded examples of

distortion isolated by the writer in developing the study. (The remaining 100 examples were used in the course of the administration of the instructional unit.) Administration of the tests took 85 minutes. The reliability of the test was estimated at .76 by the test-retest method.

The null hypothesis was used as the basis for the analysis. The data satisfied the requirements of correlation and homogeneity of variances, and were then subjected to a t test model for equated groups, yielding a t value of 2.54, which was significant beyond the .01 level. The null hypothesis was therefore rejected.

Because of the small number of items, no statistically significant conclusions were justifiable from treatment of the data yielded on the three separate subtests (one dealing with each of the three types of deficiency under consideration) which constituted the full test, nor was statistical treatment appropriate relating to the performances of the year-in-school subgroups among the subjects; the number of subjects in each year-in-school ranged from four to seven.

Chapter 1

INTRODUCTION

From the first day in his first professional position in elementary or secondary school music, the newly graduated instructor of instrumental or vocal music routinely faces certain major instructional tasks for which he has not been directly prepared in the traditional program of teacher-education he has just completed. Such tasks are among those associated with the instruction of performance groups.

With regard to the development of individual performance skills, the beginning teacher may be reasonably familiar with methods of teaching voice or most of the various individual instruments to be found in his program; the ability to develop these individual skills in his students will have received direct instructional attention in those courses broadly designated as "applied music," required for state certification.

School music instruction in America, however, does not emphasize musical instruction on an individual basis. For matters of economy in instruction (Noble, 17:42) as well as for more obviously aesthetic and social reasons, young beginning musicians in elementary and secondary schools are grouped as quickly as feasible into performance groups such

as choruses, bands, orchestras, or ensembles, remaining in such groups for the duration of their school-music careers.

In such a setting, "Nearly all of the efforts of both teachers and students have performance as the conscious or unconscious goal" (Colwell, 4:132-133). Working toward that end, the responsibilities of the instructor become those of a conductor as well, no longer limited to teaching individual performance skills to students, but broadened to encompass group performance techniques and ensemble skills.

Within those broader limits, then, the conductor should have two sets of pertinent instructional abilities at his command--those directed toward individual performance and those directed toward ensemble situations. These two sets of abilities are related and not mutually exclusive, but they are certainly not identical. They have in common the responsibility of the conductor to detect, identify, and subsequently to suggest remedies to the student for deficiencies in performance associated with pitch, rhythm, meter, attack, release, tempo, volume, tone quality, and style, among many others. As these deficiencies occur differentially in either the individual or ensemble setting, however, they necessitate quite different recognition and remediation procedures.

It is precisely these skills concerned with the recognition, identification, and remediation of ensemble

deficiencies that are not treated directly in a regularly-organized fashion within the traditional teacher-preparation curriculum in music. The following statement by Housewright (15:35) is significant in that it suggests that similar examples of non-responsive music-education curriculum may be common.

> Many teacher education programs in music have been overtaken by obsolescence. They simply have not yet met the increasing demands and changing circumstances of schooling at the elementary and secondary levels. . . . Overcoming delays in approving realistic curricula and in instituting innovative practices are problems so widespread that they command the major attention and efforts of the entire music education profession.

Several studies soon to be referred to indicate in various ways that the ability of teachers-in-training and graduates to evaluate musical performance, particularly, is often of a low order.

It is not the purpose of this study to examine the possible factors underlying the lack of such direct evaluative instruction in current teacher-education curricula. Such omissions, though, can hardly be oversights, and there is at present in the traditional curriculum no ideal course-setting, in terms of objectives and facilities (audio media of one kind or another), which in fact commonly assumes the responsibility of dealing with these particular skills. Yet, it seems unlikely that any institution devoted to training music teachers would confess that it is its intent to neglect this type of instruction in the curriculum.

These essential skills could conceivably be taught within the context of any of the traditional course-offerings as noted here. At present, though, such instruction is not commonly offered in any of these possible class settings:

Ear-training. "The way (ear-training), in most instances, is taught bears little relationship to the problems which will have to be solved by the ear in a teaching situation" (Van Bodengraven, 10:39-42).

Methods. Such courses commonly do not provide any aural experiences relating to the development of ensemble skills in the prospective teacher. "Methods" texts do, indeed, often discuss ensemble control and ensemble skills, but by their very nature can provide no more intimate contact with the attendant real-life problems than can verbal description of any non-verbal activity; words about ensemble skills (as do words about the visual arts, sports, or any activity) remain forever at least one step removed from the reality of the phenomenon itself.

Conducting. Such courses are often taught using the medium of professional phonograph recordings, over which the student has no performance control and containing performance deficiencies (if any) perhaps too sophisticated for the uninstructed conductor-in-training to detect and identify. Such courses are occasionally taught (as at Louisiana State

University in Baton Rouge) using a single live pianist as the audio medium; in such cases all problems of ensemble control are, by definition, eliminated from the experience. When live groups are used as media, the focus is most often on physical movement and interpretation, rather than on the particular skills with which this study is concerned.

Professional laboratory experiences. There is some experimental evidence that student-teaching experiences do not contribute significantly to a student's ensemble skill and may even reduce those skills in some dimension. In addition, there are at least two logically negative factors in such a setting. First, student-teaching experiences are most often not under the daily supervision of a college-level instructor. Secondly, the experiences take place under conditions where other more immediately essential kinds of learnings compete for the student's attention.

Performing groups. Student experience in college or university performing groups does undoubtedly suggest many ensemble-control techniques to prospective teachers, but such learnings are usually peripheral, usually not regularly organized, and not often a declared objective of the curricular experience.

Wherever such learnings might ideally be sponsored, the development of skills of ensemble control in a conductor-in-training should entail experience in the continuous

evaluation of aural phenomena (Jones, 7:56). Pertinent curricular experiences, then, in order to be relevant and effective in the training of a conductor, must be designed in some way to relate to aural media having ensemble characteristics. Supervised experiences in the evaluation of live aural phenomena would be ideal, but for any of several reasons the use of a live group as a medium most often appears impractical or impossible. This question then arises: could organized and supervised experiences through the medium of recordings provide the prospective teacher with some degree of those ensemble skills he will find helpful as he becomes autonomous as conductor of his own student groups? If so, such experiences--organized into an instructional unit for use at the college level--could appropriately be applicable within the framework of any of the discrete course-offerings discussed above; no alteration of the traditional curriculum would be necessary. Or, subsequent to an objective measure of its success, such a unit could be expanded into a complete course-offering for those occasions for which curricular space is available.

STATEMENT OF THE PROBLEM

Is it possible to observe a significant increase in the ability of music-teachers-in-training to detect and identify performance deficiencies in ensemble media as a function of the administration of an instructional unit

directly concerned with such deficiencies, using recorded ensemble material as a musical medium of instruction?

DELIMITATION OF THE STUDY

This study was limited to the development, administration, and evaluation of an instructional unit in certain ensemble skills as presented to selected instrumental-music-teachers-in-training at Southeastern Louisiana University during the fall semester of 1970. The unit utilized no live ensemble experiences, used recorded musical material for instruction, and was concerned primarily with only the first two stages of the detection-identification-remediation sequence of ensemble improvement procedure, though remediation was discussed in the course of the unit from time to time. The particular ensemble deficiencies concerned were those only of a disturbance in vertical linearity: deficiencies of "togetherness" known broadly as "poor ensemble," deficiencies of attacks and releases, and a type of deficiency in which the ensemble separates for extended periods into two or more distinct tempos for an extended period, and is forced into an abrupt and unmotivated change of tempo. Such matters as intonation, wrong notes, proper choice of tempo, or balance were not considered a part of this study.

DEFINITIONS OF TERMS

It should be noted that, for the purposes of this study, some definitions may depart from the traditional.

Acoustic overhang. The decay-time present to varying degrees in all performance halls, during which the sound dies away gradually, rather than ceasing immediately.

Attack. Unanimity among two or more performers in commencing musical sound; the performance result of two or more performers in commencing musical sound.

Conductor. One who instructs and directs musicians in performing groups.

Conducting. The generic description of those course-offerings in the music teacher-training curriculum usually directed toward the development of techniques of group-performance control.

Deficiency (defect). A departure in performance from the intention of the composer as interpreted by the conductor. (This term is used in preference to "error" in view of the necessity to define an area of unacceptable deviation-from-the-standard located between theoretical perfection and unmitigated error.)

Ear-training. The process of developing aural acuity in musicians; those course-offerings in the music

curriculum usually directed toward the development of aural perceptions in dealing with melody, harmony, and rhythm, presented most often in a non-performance context.

Ensemble. Literally, "together." The word may appear either as a noun or adjective. As a noun, it may refer either to a performing group, or to the quality of "togetherness."

Identification. The specification of the nature of a performance deficiency; a description of the nature of a performance deficiency.

Individual instructor. One who teaches students on a one-to-one basis.

Individual performance skills. Those skills associated with the solitary performance of an instrument or voice on the part of an individual, excluding reference to simultaneous performance with others.

Instructional unit. A series of unprogrammed classroom experiences designed, in this instance, to increase certain skills of ensemble control in prospective conductors.

Meter. Musical expectation; the organization of rhythmic impulses into preconceived patterns of predictable occurrence (Abrahams and Foss, 1:132).

Methods. The generic designation for those course-offerings in the music curriculum directed toward the techniques of teaching.

Performance groups. Any combination of more than one instrumentalist performing simultaneously.

Recognition. The awareness that an instrumental or vocal ensemble deficiency has occurred; detection.

Release. Unanimity among two or more performers in ceasing the musical sound; the performance result of two or more performers in ceasing the musical sound.

Remediation. The act of suggesting appropriate and relevant correctional procedures for an ensemble deficiency.

Rhythm. A series of musical sounds in which the impulses bear an expressible relationship (Abrahams and Foss, 1:132).

Speaking-time. The length of time, varying among the different instruments, between the sound-producing physical impulses originated by the performer and the resultant sound from the instrument itself.

Teacher-in-training. Prospective teacher, engaged in a music-education curriculum.

Time-belt. The mental conception of rhythmic feeling prepared by the musician on the basis of the smallest note within a musical passage (Schramm, 20:5).

HYPOTHESIS

The null hypothesis was used in this study, to be rejected at the 5% level of confidence. The null hypothesis was that no statistically significant difference could be observed in the ability of a group of music-teachers-in-training to detect and identify performance deficiencies associated with three types of distortions of vertical linearity as a function of an experimental treatment devised for the study, as compared with the treatment (the traditional curriculum) to which a control group was confined.

PROCEDURE

The experimental design was that described by Campbell and Stanley (3:13) as "the pretest-posttest control group design."

Subjects for the study were the 47 members of the Southeastern Louisiana University Symphonic Band during the fall semester, 1970. Membership in this group is required of all instrumental-music-teachers-in-training at some time during their student careers as a regular course in the curriculum; academic credit is granted. All of the group was required to participate. Members of the group were

equated on the basis of year-in-school, sex, and ACT percentile score, and then randomly assigned to either the experimental group or control group, as summarized in Tables 1, 2, and 3.

Table 1

Distribution of the Equated Groups on the Basis of Year-in-School

Year-in-School	Control Group	Experimental Group
Freshman	6	6
Sophomore	7	7
Junior	5	4
Senior	6	6
Total	24	23
Grand Total	47	

Table 2

Distribution of the Equated Groups on the Basis of Sex

Year-in-School	Control Group		Experimental Group	
	Male	Female	Male	Female
Freshman	4	2	4	2
Sophomore	6	1	6	1
Junior	4	1	3	1
Senior	4	2	4	2
Total	18	6	17	6
Grand Total	47			

Table 3

Distribution of the Equated Groups on the Basis of ACT Percentile Scores

Year-in-School	Control Group	Experimental Group
Freshman	20.50	20.00
Sophomore	21.43	21.57
Junior	17.80	17.75
Senior	21.83	21.67
Group Mean	20.54	20.52
S.D.	3.30	5.34

Both the control group and the experimental group were administered a pretest at the same session. The test was designed to measure initial position on the variable of ability to detect and identify (describe) audible performance deficiencies on the dimensions to be examined: a momentary and unintentional distortion of vertical linearity, deficient attacks and releases, and an extended distortion of vertical linearity resulting in two or more separate tempos, and an abrupt, unmotivated distortion of tempo.

The control and experimental groups then met separately for five one-hour class meetings over a period of one week. The writer administered the experimental treatment, to be described in detail in Chapter 3; the control group, under the control of a graduate assistant (reading the writer's instructions to the group verbatim), received a placebo-type treatment, also to be described in detail

in Chapter 3.

The posttest, again given to both groups simultaneously in the same session, yielded numerical data purporting to measure changes in the ability of each group to detect and identify the performance deficiencies which were the focus of the study. A t test model designed for use with equated groups (Popham, 9:154-158) was applied to the data yielded by the tests.

ORGANIZATION OF THE REMAINDER OF THE STUDY

This study is organized into five chapters. Chapter 1 includes a general introduction to the study, a statement of the problem, delimitations of the study, definition of terms, and a brief outline of the procedure followed.

Chapter 2 presents a review of related literature, including citation of related research studies. Chapter 3 provides a description and rationale of the experimental treatment (the instructional unit), as well as a report of the treatment received by the control group; a description of the pretest-posttest is included. Chapter 4 includes the presentation and analysis of data. A summary of the study, conclusions, and recommendations are contained in Chapter 5.

Chapter 2

REVIEW OF THE LITERATURE

Although the problem of developing the skills of aural perception in music-teachers-in-training has not appeared to be a dominant theme in the literature of music education, many writers have commented at least briefly on the necessity for pertinent curricular procedures and the apparent present lack of those procedures. There have been several experimental studies relating to these matters.

THE NECESSITY FOR PERTINENT CURRICULAR PROCEDURES

Increasing attention to the importance of developing the various aspects of effective aural perception within the framework of music-education practices has been apparent in the comments of several writers.

Housewright (15:35) pointed to the "enormous disparity between the preparation for teaching and the practice of it," adding that experienced music teachers suffer a disillusionment when they discover that their methods classes have not analyzed their "real" problems.

The "ear," or the ability to hear relationships, is the "most vital skill in the understanding of music," according to Costanza (13:50). Jones (7:195) cited the

close relationship between the thorough understanding of music and the acquisition of "accurate aural perceptions." A review of research studies relating to music education by Schneider and Cady (19:5) resulted in the conclusion, among others, that training in aural perception would appear to be of great value to the music teaching profession.

Relating directly to the skills necessary in the daily professional life of a music teacher, specific attention to the skill of evaluating performance is essential (Leonhard, 8:327). Such skills are necessarily of a higher order than mere aural perception. In order to evaluate performance effectively, as Hansen (88:147-156) pointed out, it is necessary to hear music accurately; this ability is critical for those concerned with training and directing musical groups, and whose responsibility it is to secure accurate recreation of the composers' musical notation.

Central to the ability to hear music accurately in the setting of the conductor-teacher of instrumental groups is the ability to "perceive, identify, and correct student errors during rehearsal periods" (Sidnell, 21:1). Without this skill, it is highly unlikely that desirably high standards of musical performance can be realized. Pryor (91:5) confirmed that instrumental music teachers must be able to identify accurately and diagnose performance deficiencies, or else be unable to remedy the faults of

his students.

Performing musicians, too, as apart from music educators, have seen the need for developing aural skills, with Edwin Franko Goldman (6:44-46), in particular, calling attention to the importance of pertinent aural training.

With respect to the specific aural perceptions with which the present study is concerned, it should be noted that the published standards (National Interscholastic Music Activities Commission, 94) by which most band performances at festivals are evaluated call for specific ratings by the adjudicators on such items as "control," "precision," and "rhythm." Benn (2:342) confirmed the specificity of such items in counseling new teachers to "develop the ability to judge duration, since the motion of music is inevitably rhythmic and must go forward in time."

Given the generally subjective nature of the art of music, evaluating musical performance is extremely difficult, and is a task which deserves the attention of music educators (Sandford, 18:58).

THE PRESENT LACK OF PERTINENT CURRICULAR PROCEDURES

Many of the writers who have expressed the necessity for pertinent curricular procedures (as well as other writers) have understandably commented also upon the apparent present lack of such procedures.

Recognizing that the development of basic aural skills is indeed a part of most music education curricula, there is considerable doubt as to the appropriateness and effectiveness of many of the traditional approaches to the problem. Questions arise first regarding the specific techniques utilized in such traditional approaches. Sidnell (21:2) pointed out that students are rarely exposed to the instrumental combinations of various sizes and homogeneity with which they will be faced later, and added that aural experiences must be oriented toward a realistic rehearsal situation.

Drake (14:43) pointed out the lack of pertinent curricular procedures in calling attention to the heavy emphasis (in conducting courses and textbooks on conducting) on baton technique and related matters. He stated further that the knowledge and techniques necessary to the conductor are often neglected in his education; these techniques should help the conductor to realize satisfying musical experiences in rehearsal and in concert.

Worrell (24:1065) reported three areas that needed more emphasis in the undergraduate music-education curriculum; one of these areas was hearing mistakes in performance. In his study, he found that only 16.5 percent of the subjects accurately identified 50 percent or more of the errors (test items).

Although creating an actual rehearsal situation in

which to teach the appropriate techniques might be impractical, Hansen (88:51) emphasized the need for some type of rehearsal situation in which to learn.

Regarding present traditional methods of teaching aural perception, several writers have commented on the inappropriate use of the piano as a medium. Costanza (13) said that such attempts are limited in scope. Mark (16) agreed that getting away from the traditional use of the piano for "ear-training" is necessary. Techniques need to be developed to help the student fill the gap between perception, music notation, and performance (DiFronzo, 87). Carlsen (11) found, predictably, that learning procedures allied with the learning task will produce superior training results. The implication was that students expecting to work with performance groups should be trained in a similar setting.

Pryor (91:31) found that advanced undergraduate music students were remarkably deficient in their ability to identify and describe performance errors. It is especially interesting to note that those students among his subjects who had completed their student-teaching experiences were significantly less able in several of the particular areas of error he examined than those students who had not yet begun their student-teaching experiences.

The problem of transfer, when traditional ear-training methods are used, was a concern of a study by

Sidnell (21). Recognizing that certain aural skills are developed by "regular" classroom activities and drill, he found that little evidence of transfer to the real-life problems of conductors could be cited. Many students seemed unable to synthesize their skills and use them in solving their group-performance problems.

On the other hand, Mark (16:56) raised the question of "whether the ear becomes well trained as a result of learning to recognize errors, or whether the ear learns to recognize errors as a result of being well trained."

In summation, Noble (17:42-43) said, "How music is taught has not changed significantly in the past fifty years. Perhaps music education could learn a lesson from mathematics, science, and social studies, which have succeeded in revolutionizing their teaching methods within the past sixteen years."

In a study by Werner (23:29), "curriculum considerations" in general were cited by an overwhelming majority of students as a basic issue in their listing of unresolved areas in music education today.

RESEARCH RELATED TO THE PRESENT STUDY

The writer knows of no reported research relating directly to the present study. Certain studies are peripherally related and are cited briefly here.

The use of tape-recorded musical excerpts for

development of aural perception is not new. Cookson (5), as early as 1949, indicated that the use of such recorded material was effective, and further speculated that such material might be adapted for use on a self-instructional basis. The feasibility of tape-recorded materials for extra-class drill in developing aural perceptions was established by an experiment at Ohio State University (Spohn, 22). Clough (12) also indicated the possible values of recorded material in developing aural perceptions. Carlsen (11) adapted recorded material to programmed learning and found it successful as an adjunctive learning experience, specifically with regard to melodic dictation.

Hewlett (90) summarized several experimental investigations which established that tape recorded materials can be at least as effective in ear-training procedures as traditional methods.

Most less-peripherally related research is concerned with the identification or detection of performance errors, concentrating, however, on the ability of the student to compare the instructions conveyed by the printed score with the resultant aural phenomena produced by the performers. (On the other hand, the present study deals with performance deficiencies which the capable conductor-teacher must be able to detect and identify without reference to the printed score; the difference in approach is crucial.)

One such visual-aural-relationship study, by Sidnell (21:5), tested the error-detection ability of the subjects through an ingenious four-frame programmed presentation, each frame increasingly isolating the error. In this study, Sidnell recognized the problem of control over the performance-level of the recorded musical material, in that it was necessary to limit each excerpt to a single error in the setting of an otherwise-perfect performance. A previous pilot project by Sidnell (92) had established the significant effectiveness of the use of recorded musical drill-material with regard to visual-aural discrimination.

A visual-aural study was completed by Costanza (13:32) in which the behavioral objective was to develop the ability to detect whether or not the performance of a musical excerpt conformed to the printed score, requiring the subjects to follow a printed score while listening to the performance. The two types of errors examined in this study were the "clinker"--an obvious mistake caused by the addition or omission of an accidental, and a doubling error, in which the wrong note was doubled.

Another visual-aural-relationship study, among the first in this particular area of interest, was that of Hansen (88), which was concerned with the ability of musicians to read and hear important elements of music, such as melodic and harmonic intervals and chords. The conclusions of this pilot study were based on one contact with each

subject, through a test administered within one 50-minute college period.

Hartwell (89) also dealt with visual-aural relationships in his study.

A study by Dolbeer (95) concerned instruction for prospective teachers with regard to error-detection in music performance. The dimensions examined were restricted to pitch (by at least one-half tone) and rhythm (as defined by the performance of rhythmic patterns different from the printed score). A weakness of this study would seem to be that his recorded examples were all produced in a sight-reading session, possibly introducing additional errors. An interesting feature of this study was that the recording group (a college band) was encouraged to play intentionally out-of-tune in order to simulate a real-life high-school situation.

Other related studies using research designs and numbers of subjects similar to the present study were by Spohn and Poland (93), Bigham (86), using 30 subjects, DiFronzo (87), comparing two classroom music methods, and Costanza (13), using 16 subjects.

SUMMARY OF THE REVIEW OF THE LITERATURE

The necessity for curricular procedures pertinent to the focus of the present study was documented. The theme of the relevant professional comments centered upon the

importance of effective curricular experiences in developing aural perception in music-teachers-in-training. The content of such experiences should include training in hearing music correctly, evaluating musical performance, and in developing the specific ability to detect and diagnose performance deficiencies. Several sources indicated that such curricular experiences are not presently a sufficient part of the traditional music-education curriculum, and that some music teachers are being graduated with a low order of skills necessary along those dimensions. Little experimental evidence can be cited indicating that transfer occurs from traditional training to real-life problems in this area.

Literature pertaining to several peripheral concerns was cited. The use of training procedures involving tape-recorded musical material was reported. Several studies were cited which were concerned with detection of performance errors; each was concerned with the aural-visual relationships involved with score reading and evaluation of the finished musical product, which is not a concern of the present study. Other studies were cited briefly in which research designs were similar to that of the present study, and a similarly small number of subjects were utilized.

The writer knows of no reported research relating directly to the present study.

Chapter 3

DESCRIPTION OF THE EXPERIMENTAL TREATMENTS

The instructional unit was developed from an initial pool of 150 recorded examples, from five seconds to fifty-five seconds in duration, each illustrating aurally the three not-necessarily-discrete types of performance deficiencies which were the focus of the instruction. From this pool, 50 were selected for the pretest-posttest and thus were not a part of the instructional unit, leaving 100 items to be discussed verbally during the instructional periods.

None of the examples was identified to the students with regard to composer, title of composition, performing artist, or type of performing group. For the purposes of reporting, compositions, titles, and performing artists have been identified in the detailed descriptions of the material for both the instructional unit and the tests.

Since it was essential to restrict the examples so far as possible to those containing only a single defect, 86 percent of the excerpts were extracted from professional, commercially available phonograph recordings, or from recordings of live professional performances. The remainder of the examples were extracted from recordings of advanced student groups.

Various types of performance groups were included, such as symphony orchestra, string quartet, string quintet, symphony orchestra with soloists, concert band, military band, jazz ensemble, folk groups, and classroom elementary instructional records--providing the subjects with a wide range of performance media with which to deal.

The instruction and tests were conducted with the use of an Ampex Model 1260 tape deck, with Ampex amplifier and speakers. All of the instructional material was recorded on a single, sequential tape. Although the quality of the original recordings was somewhat uneven, each was of sufficient quality that the deficiency under examination was audible.

The deficiencies contained in the entire group of 150 examples were chosen by the writer on the basis of professional judgment as a result of a study for that purpose of 61 recorded compositions.

The existence of the deficiencies isolated was validated by the confirmation of three of his associates of the faculty of the Department of Music of Southeastern Louisiana University. Two were concerned with instrumental music (Mr. Ronald Nethercutt and Mr. Robert Priez), and one (Mr. Eugene Ferguson) represented the vocal department.

The unit dealt with three types of deficiencies. A Type 1 deficiency exhibited a momentary distortion of the necessary vertical linearity, absolute vertical linearity

being the ideal. Due to the misperformance of one or more members of the performing group, this type of deficiency occurred for durations ranging from one to four seconds, and the deficiencies were grouped according to a subjective judgment regarding their probable difficulty level, with the more obvious examples being presented first. A total of 49 Type 1 deficiencies was examined in the course of the unit.

Type 2 deficiencies contained examples of deficient attacks and releases, primarily a function of the judgment and expertise of the performers involved. The attack or release of any individual player was not considered a defect for the purpose of this unit, and such aberrations were defined to include only those ascribable to two or more players, there being, by definition, no possible problem of vertical linearity when only a single player was involved. The deficiency in ensemble (togetherness) must necessarily have been audible. The unit contained 36 Type 2 examples.

The Type 3 deficiencies consisted of 15 excerpts in which the ensemble tempo, ideally one of unity, degenerated at some point in the excerpt into at least two distinguishable differing tempos over a period of from 10 to 30 seconds. Included as a Type 3 deficiency was any resultant abrupt and musically unmotivated (and unintended) change of tempo.

All of the 150 excerpts used in the study included some degree of context both before and after the occurrence

of the defect, since a complete isolation of the defect would not have been as instructive as in a context presentation. In real-life situations, however, it is true that the conductor is expected to isolate such deficiencies within the context of the complete performance. For instructional purposes, though, such an expectation would have been impossible to handle within the time limits available for the instruction. Since the unit was instructional, no excerpts were included which did not contain a deficiency, nor were defect-free excerpts presented in the tests.

Since deficiencies must commonly be dealt with by the conductor without regard or reference to "types," there was no functional purpose in such a categorization in this study, other than the possibility of evaluating the data yielded by the posttest with a view to determining possibly varying success among the subjects in learning to deal with such a categorization. However, because of the relatively small number of subjects (47) and the relatively small number of posttest examples of Types 2 and 3 (17 and 8, respectively), only superficial conclusions were drawn from the resultant data, as reported in Chapter 4.

The actual instruction of the unit was begun only with a review of the characteristics of each type of deficiency under examination. Rather than presenting the subjects with a formalized set of rules, each excerpt was

played once, after which the deficiency, its location and its description was discussed verbally by the instructor. Classroom interaction was encouraged and, except in the cases of the most obvious deficiencies, such interaction did occur.

As reported in the following section, the descriptive and instructive comments relating to each example necessarily represent only an outline of the complete discussion, and do not describe any classroom interaction that took place. They should, nevertheless, provide information relating to the various areas of concern appropriate to each excerpt, and to the instructional unit as a whole.

The control group was conducted in simultaneous sessions under the direction of a graduate assistant, who was charged with the necessity to instruct the group only through a verbatim reading of the writer's instructions to them. The control group, receiving an essentially meaningless treatment in terms of the present study, was required to listen to recordings of compositions, and to write any comments they deemed appropriate for each one. All written work was handed in and reviewed by the writer. No further structure was provided, although many of the group (having been exposed to the same pretest as the experimental group, and knowing that they were a part of an experiment) did respond in terms of performance deficiencies. The written comments did cover an understandably wide range of content.

The rationale for the placebo-type treatment received by the control group was not one of teaching the experimental group and denying instruction to the control group. Rather, the control group represented those being taught the skills under examination by the "method" currently in use at the University, which is, of course, one of expectation that the students will acquire such skills in the context of any or all of the various course-offerings in the curriculum. Thus, the experiment purported to measure the comparative results of students as taught, in effect, by two different methods, rather than the results of one teaching method as opposed to no instruction whatever.

TYPE 1 DEFECTS

Example 1

The timpani plays late on the afterbeats in this waltz passage (Tschaikowsky, 80), and the degree of lateness is sufficient to lead, in turn, to a loss of cohesion between the orchestra and the chorus.

The correct performance of afterbeats is a problem often encountered by the conductor, particularly in those fast passages in which there is only one visual beat per measure. In such excerpts involving the timpani, the conductor must evaluate for rhythmic precision in the light of the difficulty the player experiences in dampening the vibrations of his instrument between every measure (in order

to provide for the necessary quarter-note rest on the following *downbeat*). It is also necessary for the conductor to be aware of the problem of overcoming the effect of the distance between the conductor and player under the physical conditions common in many orchestra pits, which place the timpani at the greatest possible distance from the conductor.

Example 2

A moderate 4/4 passage for chorus and orchestra (Verdi, 84) is punctuated by tambourine strokes which are uniformly late.

This excerpt provides a clear opportunity to assess the difference in speaking-time between the string pizzicatos and the less-well-defined sounds of the tambourine. The conductor must evaluate the vertical linearity between the two discrete types of sounds, determining whether the results occur at the proper time.

Example 3

The tambourine sounds consistently ahead of the beat in this allegro 2/4 passage (Verdi, 84).

This is a relatively unusual type of defect in the performance of the tambourine. By virtue of its construction (with steel sounding-rings which are not set in motion until a moment after the performer moves the instrument in one of

several ways), the tambourine commonly errs by playing on the late side of the beat. However, in rapidly-repeated single strokes of the instrument, as in this passage, it is sometimes difficult for the performer to avoid playing early.

Example 4

The straightforward allegro 4/4 passage (Shostakovitch, 72) has the tempo set adequately; at the entrance of the trumpets (occurring after an eighth-note rest on the downbeat) they rush the ascending scale for the remainder of the passage.

The problem in this defect are two-fold. The most obvious offense is the rushing of the trumpets, but this rushing is likely to be caused, in turn, by their late entrance after the eight-note rest on the downbeat. The difficulty of beginning an entrance on any but the first part of a beat is in evidence here. Instrumentalists often (if they are aware of having made a late entrance under such conditions) attempt to make up for lost time by means of a subsequent rushing. Remediation on the part of the conductor will lie in his insistence on timely entrances occurring after any short, on-the-beat rest.

Example 5

The tempo is established by the preceding musical material (Bizet, 31) but the tambourine, playing only

intermittently during the passage, is consistently behind the beat.

The typical problem of tambourine performance is illustrated here. It is especially likely to occur in this particular type of passage, consisting of short bursts of sound from the instrument. These bursts are especially troublesome for the performer to produce, due to the necessity of starting and stopping the sound for each individual note.

Example 6

Following a 3/4 passage (Massenet, 60) of relative rhythmic stability, an abrupt one-measure ritenuto is performed raggedly by the majority of the orchestra.

Ritenutos, as a rather immediate reduction in speed, are often a problem for both the conductor and the orchestra, inasmuch as there is little opportunity to prepare the ritenuto adequately. Confronted with such a defect, the conductor should examine the possibility of the cause residing in his own technique, but, in addition, he may also expect defective results if the orchestra is not watching closely at such moments.

Example 7

On the second phrase of this steadily-moving excerpt (Chopin, 34) the snare drum on the afterbeats becomes progressively later and does not sound with any other section

of the orchestra. For that reason, the conductor may suspect that the snare drum is not with the visual beat either.

Although the snare drum is a relatively quick-speaking instrument once the stick has come in contact with the drum-head, the player must properly anticipate the time required for the preparatory hand and wrist movement before the moment of impact. The defect in this excerpt, then, probably represents faulty timing in that regard on the part of the performer, but can also indicate that the player is neglecting to watch the conductor closely enough. The problem is compounded by the fact that the passage consists of afterbeats, which are often heard misperformed in the examples presented in this unit. An additional situation which should alert the conductor to possible behind-the-beat playing on the part of the percussion instruments is their physical placement in the orchestra, which is commonly the farthest removed from the conductor of any instrumental groups.

Example 8

Rhythmic stability is good in this 12/8 passage (Respighi, 68) except for the tambourine, which sounds behind the remainder of the ensemble.

It has already been noted that the physical construction of the tambourine requires a special approach on the part of the performer if he is to avoid sounding late. For

this reason, the conductor should always evaluate tambourine passages, especially, for this type of defect. In addition, the problem of timely sound-production is often more apparent to the conductor than to the player.

Example 9

The triplets in this passage for muted trumpets (Richard Strauss, 78) are not together; at least one of the trumpets is not properly with the section.

The defect itself is apparent in the muddied effect of the trumpets, which are capable of sounding with clarity when the vertical linearity is not disturbed. Muted trumpets are somewhat more difficult to play in tempo than open trumpets, since the mute slightly increases the speaking-time of the instrument. When trumpets are required to perform passages involving rapidly shifting harmonies, as well as varying rhythmical patterns, the conductor should be aware of the possibility of vertical non-linearity.

Example 10

This excerpt (Richard Strauss, 78) is nearly identical to Example 9, with the addition of the saxophones, which increases the degree of the non-linearity.

The instructional comments presented for Example 9 above apply here also, but the defect is more obvious with the addition of the saxophones to the passage. As more instruments are added, the potential for this type of defect

is increased, especially when the instruments involved have such disparate tone qualities as the trumpets and saxophones, since the non-linearity becomes more audible.

Example 11

The ritenuto at the climax of the ascending phrase between the baritone and the orchestra (Verdi, 82) is poorly coordinated, the timpani being behind the remainder of the ensemble.

It has already been pointed out that the ritenuto presents special problems for the conductor in maintaining proper ensemble. This is particularly true when the timpani is actively involved at such moments. Being placed physically at the very edge of most opera orchestras, the timpani will not receive the same mutual reinforcement regarding the exact nature of the ritenuto as will the remainder of the orchestra. For that reason, the conductor must check the timpani particularly on such passages.

Example 12

A 4/4 passage (Bellini, 28) is set well at a moderate allegro tempo and the ensemble progresses satisfactorily through some reasonably complex rhythmic sequences until the point at which two measures of successive eighth note triplets occur in the woodwinds; the ensemble disintegrates there.

As seen in the context of the examples prepared for

this unit, it is more difficult for the performer to divide each beat into triplets than into duple units. This phenomenon is often demonstrated as a disagreement among the performers regarding the exact nature of the spacing of the triplets, some players preferring to group the notes into successive, discernible patterns of three notes each, others preferring (more correctly) to regard all triplets as evenly spaced notes. The difference in opinion must always be evaluated by the conductor, or he will suffer the consequences so aptly illustrated by this exerpt.

Example 13

Violins, violas, and the low brass have this series of five unequally spaced notes to perform (Bellini, 28); the vertical linearity is upset.

The speaking-time among this group of disparate instruments is varied, and such passages usually have the potential of ensemble disorganization for that reason. The conductor must be alert to the possibility of the occurrence of such defects when evaluating the success of similar passages.

Example 14

On the penultimate chord, the violoncello is noticeably early ("Little Man in the Wood," 55).

Although this passage for a small chamber group involves no conducting as such, the particular defect

illustrates clearly the typical sound of two instruments (violin and violoncello) failing to attack simultaneously.

Example 15

The initial attack in this passage ("Slumber Boat," 74) is anticipated by the violoncello.

This excerpt demonstrates that it is not always the instruments with the slower speaking-times that can produce defects in vertical linearity. In this case, the violoncello, even with its slower speaking-time due to the longer string-lengths, over-compensates for that difference, thus producing the defect of an early entrance.

Example 16

The four-measure 2/4 allegro introduction to this passage (Johann Strauss, 75) is set poorly by the entire ensemble, with the timpani contributing the major portion of the defect by being late on the two eighth notes immediately preceding and following each barline. In addition, the French horns, whose function it is to set the rhythm by repeated eighth notes throughout the passage, are playing ahead of the beat.

The particular writing of the timpani part contains the seeds of the defect here. The conductor should anticipate lateness of the timpani on the particular rhythmic figure at this point, and may evaluate the problem by checking of vertical linearity between the timpani's

intermittent eighth notes and the steadily-repeated eighth notes in the French horns.

Example 17

The excerpt (Verdi, 84) is for chorus and orchestra, rhythmically regular, and well-performed by the entire group except for the percussion (tambourine and triangle), who play consistently behind the beat for the duration of the passage.

This particular defect is somewhat unusual in that the tambourine has more tendency to speak late than the triangle, for reasons discussed with regard to previous examples. Yet, in this particular excerpt, these two percussion instruments sound very well together, but are also together in playing behind the beat. The conductor may evaluate this defect by accepting as correct the majority opinion regarding the tempo. The chorus and the orchestra are together, and the two percussionists are simply outweighed by being divergent in their performance.

Example 18

The passage (Holst, 50) is straightforward; the snare drum and low brass are not together on the descending scale passage. The low brass rush, the snare drum is behind.

This defect is not difficult to detect with regard to the locus of the offenses, but may be somewhat more difficult to assess specifically in terms of which group is

ahead and which behind. As always, the conductor must set the concept of meter mentally and evaluate the performance against his own concept. If he does that in this excerpt, he will discover that the low brasses are ahead and the snare drum plays late.

Example 19

Although the exerpt (Rachmaninoff, 66) contains relatively simple rhythms, the passage is antiphonal between the solo piano and the accompanying orchestra, and the rhythm is broken by the faulty entrance of the orchestra, which produces excessive spacing between the two voices.

In passages of this nature, requiring antiphonal effects in unvarying meter, a solo instrument is always capable of more precise control than the full orchestra. Therefore, the orchestra itself must be evaluated for precision on those occasions, if only because of the relative weight of the group as contrasted with the solo instrument. It may be expressed in terms of inertia: the soloist has very little inertia to overcome on each of his entrances. The orchestra (by sheer weight of numbers, if nothing else) has a considerable inertia to impede its orderly progress.

Example 20

In this passage (Brahms, 32), two series of three repeated woodwind chords with French horn are presented; the first series is acceptable, the second series is not together.

Additionally, the French horns on the second series unaccountably alter the length of the notes, contributing an additional factor of poor releases to the performance.

Repeated series of rhythmic patterns must be evaluated particularly by the conductor, since it is essential that the character of each series be maintained precisely by the performers. Whatever the cause, it is often apparent that performers are negligent in this respect, of which this excerpt is evidence.

Example 21

Three quarter notes in the upper winds (Richard Strauss, 77) are not together.

The detection of this defect will cause little trouble for the conductor, which is serious enough to be apparent to even the casual listener. Regarding the probable causes of such a defect, they can lie either in poor technique on the part of the conductor, or insufficient concentration on the part of the performers, and remediation will be possible in an examination of either of those areas on the part of the conductor.

Example 22

The tempo of this example (Shostakovich, 72) is steady, but the passage is marred in the second phrase by afterbeats in the strings, which occur progressively later as the passage progresses.

As already noted here, afterbeats are often a problem, and can usually be detected by maintaining a firm mental concept of the subdivisions of each beat. In such cases, concentration of the conductor on the beats themselves is insufficient; the cause of the defect is likely to such a lack of subdivision on the part of the performers. The conductor's time-belt (and the time-belts of the players) must always be consistent with the smallest subdivision of the beat within any particular passage. The proper setting of such time-belt is the key to detection of this defect.

Example 23

This moderate 3/4 passage (Bizet, 30) has the tempo set well by the rhythmic figures in the strings. Over this accompaniment, the two solo flutes are quite accurate on their eight notes, but tend to rush on the sixteenth notes.

Conductors, must listen critically to passages containing a majority of notes of a certain value, but interspersed with notes of a different value. As in this passage, the tendency to rush on the faster notes seems to be a problem related to the technical difficulties in the performance of each instrument, and it can often be noted that such passages are difficult for the instrumentalist to control. The conductor should approach such passages guardedly.

Example 24

The tempo of this passage (Bizet, 30) is set accurately by the string accompaniment, but the trumpet solo entrance is late.

The solo entrance of the trumpet occurs on the last eighth note of the measure. Conductors must check for proper timing by careful mental subdivision into the smallest rhythmic unit of the passage in order to evaluate correctly the proper entrance of any voice required to begin on any portion of the beat other than the downbeat.

Example 25

This movement (Lalo, 52) ends with four pizzicatos in the strings, which are not performed with sufficient vertical linearity in this excerpt.

Similar passages, when bowed, produce enough overlay of sound (due to the varied length of bow and exact timing taken by each performer in the section) so that such defects tend to be obscured, less obvious, and therefore less damaging to the performance. Pizzicatos, on the other hand, by the very nature of their characteristically dry sound, demand the utmost precision. Since there is little resonance in the sound produced by the pizzicatos, the failure to achieve vertical linearity on those occasions tends to be rather obvious, relatively easy to detect, though less easy to correct.

Example 26

Three rhythmically identical sequences of five notes each constitute this passage (Bellini, 28), the first series played by the winds, the second by the strings, and the third by the high woodwinds. The first and second series are poorly performed; the final series is successful.

The success of the third series provides the conductor with the model against which to evaluate the first two series. Sequences of this type are relatively easy to evaluate because of the necessity for each sequence to be rhythmically identical; departures from vertical linearity are easy to detect.

Example 27

In this very short excerpt (Bellini, 28) of four string chords, the final chord is preceded by an eighth-note rest, during which one or more violins anticipate the final chord.

The problem is that of renewing the musical sound following a short rest. Calculating the exact length of a rest often seems more difficult (in the context of the examples presented here) than the duration of a sounding note. The conductor must regard every such internal short rest as a potential problem-area and evaluate for possible defects at such moments.

Example 28

The composition ("Clouds," 35) ends with the clarinet and soprano in sixths, performing (immediately prior to the final resolution) a rhythmic pattern of a dotted-quarter note followed by an eighth note. This pattern is distorted here by the difference in interpretation of the figure on the part of the clarinet.

The conductor (even though no conductor was present for the actual recorded excerpt presented here) must evaluate the passage by subdividing the figure into eighth notes, making it easier to detect a divergence on the single actual eighth note contained in the passage. Such mental subdivision is a requisite activity on the part of the conductor, and one that he may not abdicate, since the failure of the performers themselves to subdivide in such a manner often leads to this type of defect.

Example 29

The first violin anticipates the first note of the second phrase in this arrangement for string quartet ("America," 26).

The performance of chamber music should present no unique problems in defect-detection, though it is the shared responsibility of each member (or the designated responsibility of the "leader") to identify such defects. In either case, defects often occur. This example provides the opportunity for the listener to detect and identify the problem,

which is clearly in the performance of the first violin.

Example 30

The tempo of this passage (Mozart, 61) is set well by the second violins, with regular, repeated eighth notes in 4/4 time. At the entrance of the melodic material (played by the first violins and violas in sixths) the ensemble immediately disintegrates.

Although melodic entrances occurring against a previously set background of regularly recurring notes should present little problem, it is apparent in the lack of success of this excerpt that the conductor must evaluate the actual performance of the melodic instruments against the framework of the regular background. Inattention or lack of skill on the part of some performers can produce defects in passages where they may be least expected.

Example 31

The passage (Richard Strauss, 78) is one of a gradual accelerando, which the timpani did not make successfully.

The performer here is faced with the double problem of correctly interpreting the exact character of the accelerando and of compensating for the expected time-lag due to the usual to-the-rear physical placement of the timpani. The conductor should evaluate for this defect by listening for the relatively clean sound of good ensemble, which is obviously missing in this case.

Example 32

A slight ritardando occurs in this passage (Delibes, 38) in which the timpani and brass are poorly coordinated.

The defect here is probably caused by the ritardando itself, its communication by the conductor, and its interpretation on the part of the performers. Ritardandos which occur with little opportunity for the conductor to prepare must usually be regarded as suspect with respect to possible defects of this type; this particular excerpt provides a clear aural image of the typical sound of an unsuccessful ritardando.

Example 33

During a long accelerando for the entire orchestra (Falla, 44) the French horns are required to play afterbeats at the ever-faster tempo. The tempo at which the French horns perform the afterbeats is not the same tempo as that chosen by the conductor and agreed to by the remainder of the orchestra; the French horns are consistently behind the group.

Afterbeats (never without a defect-potential, as demonstrated in this unit) are even more difficult to execute when it becomes necessary to depart from a steady, regular rhythm. In a passage of this sort, it is necessary for the performers to assess continuously the exact nature and extent of the accelerando and to space the afterbeats accordingly. In this example the necessity was not met by

the French horns; the conductor must evaluate it by subdividing mentally (even during his own accelerando) into the smallest rhythmic unit of the passage.

Example 34

The tambourine has afterbeats for each beat of the 3/4 measures in this passage (Bizet, 31) but is consistently behind the beat.

Another example of the difficulty in obtaining vertically linear performance from the tambourine, this particular excerpt should not be particularly troublesome, since the requirements are for sounds at regular intervals. Yet, it is apparent in listening to this passage critically that the problem of afterbeats themselves is not being solved by the performer.

Example 35

The series of short, sequential figures in this excerpt (Tschaikowsky, 81) involves an upward slur for the violins, violas, and violoncellos. The first two figures are successful; on the third the strings become divided rhythmically on the upward slur.

Since this passage occurs at a relatively slow tempo, the strings are faced with the necessity to agree on the exact moment at which the slur (almost a glissando in this case) is to take place; they need also to agree on the fingering technique involved. This same passage at a

markedly faster tempo might present little problem, but the conductor must evaluate slow passages of this type with particular care, making certain that the character of all such sequential passages remains the same.

Example 36

The triangle is required to play only on the first beat of every measure in this regular 3/4 passage (Verdi, 84); the results are late on several measures within the passage.

Since the triangle has a comparatively short time-lag between the beginning of the beating-stroke and the occurrence of the sound, it is likely that the degree of lateness displayed by the performer in this particular excerpt is due to his inability at that moment to follow the printed music and the visual beat at the same time. The conductor must check to make certain that players of the percussion instruments--perhaps even more so than players of other instruments--maintain firm contact with the visual beat. All the percussion instruments are solo performers, in a sense, and defects in performance among them do not have the advantage of blending in with an entire section, in the manner of a possible defect in the performance of a single violinist within a section.

Example 37

In this 3/4 passage in one beat per measure (St. Saens, 69), the triangle afterbeats are late.

The special problem of afterbeats in such passages has been discussed earlier in this unit and afterbeats present no unique problems to the performer of the triangle. This excerpt serves to illustrate additionally the frequency with which this particular defect occurs, and to warn the conductor to be especially alert in such situations where vertical non-linearity is likely to occur.

Example 38

The woodwinds set the tempo precisely with their eighth notes in this passage (Shostakovich, 73) and the bass drum is required to perform three notes in a very simple pattern. The lack of precision is audible.

The bass drum is particularly prone to behind-the-beat performance. One cause of this difficulty is the relatively late speaking-time of the instrument itself. The problem is also partially due to the length of the foreswing necessary before actual contact of the stick with the drumhead. The player must learn to anticipate the foreswing correctly in order to time properly so that the contact of the stick with the drumhead occurs enough ahead of the actual beat to allow the instrument to sound to the conductor at the appropriate moment.

Example 39

A general disorganization of the tempo is audible in this passage ("El Gusto," 41), with the constituent members

of the ensemble sounding uncertain as to either the basic rhythmic pattern or the proper time at which to execute those patterns.

This type of passage would be easier with a conductor, though this type of group routinely performs without a formal conductor. Nevertheless, the audible result offers an example of poor ensemble performance which can be instructive to the conductor in terms of the characteristic sound of a poorly-executed extended passage.

Example 40

The 6/8 rhythm is well established at a forte volume level in this passage (Brahms, 32), but as the volume lowers correctly to mezzopiano, the rhythmical stability degenerates.

The conductor must expect possible defects in passages which require the instrumentalists to change one dimension without changing the other. In this example, the requirement to reduce the volume level led to an alteration in the vertical linearity, also. In a similar manner (though not illustrated here) an increase in tempo often produces a greater volume level. The conductor must evaluate changes required in one dimension to make certain that such changes are not associated undesirably with alterations on another dimension.

Example 41

This passage (Marquina, 59) of necessarily-strict and unvarying tempo is marred by the rhythm instruments (guitar and percussion), which gather speed slightly.

Although the usual problems with regard to the percussion instruments center around late playing, there is also the opposite possibility to consider. Such tendencies vary among individual performers, some tending to play ahead, some behind. Since rhythm instruments must, by definition, be rhythmically reliable, the conductor must determine continuously that the function of that group of performers is being fulfilled.

Example 42

The rhythm is generally well-defined in this passage (Bizet, 30) but the timpani is somewhat late throughout the excerpt.

Although the defect itself is of relatively small magnitude in this particular example, the conductor should evaluate such moments to determine whether the fault lies with the temporary failure of the performer to watch the beat, or his failure to anticipate sufficiently to allow for the distance between his instrument and the conductor with respect to the time for the sound to reach the podium.

Example 43

This excerpt ("Little Bird," 54) consists of four

phrases in 3/4 time, with the first and second violins playing melodic material in thirds. On each section beginning on the third beat of a measure, the first and second violins are not together.

This example is significant in that it illustrates the comparative difficulty of playing passages properly together which begin on the third beat of a 3/4 measure. It will be noticed further that more difficulty is encountered when beginning each of the four phrases, whereas the same rhythmic material within the phrase produces no defects here. Once the phrase is commenced, internal changes in patterns produce less problems than those presented in recommencing the same figure at the beginning of the following phrase. The conductor must evaluate critically the beginnings of phrases, particularly.

Example 44

This passage for strings (Haydn, 49) is not together for the first measure, more successful in the second measure.

The passage begins on the last half-beat of the preceding bar--a situation which, as seen in this instructional unit, often presents problems of vertical linearity. The problem is intensified when the tempo is fast (about 120 quarter notes per minute, as in this example), since it leaves the performer very little time to decide (on the basis of the preceding half-beat of performance) on the tempo the

conductor actually wishes to communicate. The conductor must, in turn, evaluate the decisions of the players and their resultant performance; the defect here is audible.

Example 45

In this four-measure phrase (one beat to the measure), the brass tends to rush to the climax, the timpani to drag (Weber, 85).

As discussed with regard to Example 40, the problem here is one of the necessary alteration of one dimension (volume) without altering another (the tempo). As the volume increases rapidly in this four-measure phrase, the tempo also increases. An additional defective factor is that the brass and timpani are not in agreement regarding the exact nature of the accelerando, being influenced in differing degrees by the tendency to rush when the volume level is increased.

Example 46

In this 9/8 passage (Respighi, 68) the strings set the tempo with a steady pattern of equally spaced eighth notes, against which the low woodwinds must fit a passage consisting of combinations of quarter notes and eighth notes. They are unsuccessful in this example.

A generalization with regard to proper ensemble performance is that the performers with the fewer notes are required to fit them in with the performers having the more notes. However, if all performers operate with the same

time-belt properly adjusted to the fastest notes into which a particular passage can be subdivided, the proper outcome will also result. A basic factor underlying the practical application of these generalizations is that the performers with more notes to play (provided the notes are not technically difficult) tend to be steadier, in passages of reasonable speed.

Example 47

A melody (Weber, 85) in sixths is divided among the violoncello, flute and clarinets; the result is poorly synchronized.

It can be observed that in many cases string players tend to be slightly more expansive than wind players (particularly in solo passages). Regardless of the reason, the violoncello solo is behind in this passage; conversely, the woodwinds can be said to be ahead.

Example 48

This short excerpt (Respighi, 68) for strings contains a series of measures containing an eighth note isolated by rests, the same figure continuing over a space of three measures. One of the isolated eighth notes is marred by the anticipation of one or more of the performers.

Any note isolated by rests presents a particular problem to be evaluated by the conductor, since the vertical linearity must be re-established on each such occasion. In

such passages the problem of evaluation itself is increased for the conductor, and requires his constant check on each such isolated eighth note, as in this passage.

Example 49

In the introduction (Weber, 85), the final cadence in the woodwinds, immediately prior to the entrance of the violoncello is not together.

The resolution of chords is to be evaluated particularly by the conductor when the tempo is slow. The defect here can be identified and located if the conductor will check the performance against the time-belt he has established for himself and against which he determines where to place the visual beat. In this particular passage, a mental subdivision is to be preferred to a visual subdivision, inasmuch as the passage contains no undue complexities for the performers.

TYPE 2 DEFECTS

Example 1

The oboe and clarinet entrance in this excerpt (Verdi, 83) is marred by the early entrance of the clarinet or, conversely, by the late entrance of the oboe.

The speaking-time for these two instruments differ. The conductor relies on the expertise of each instrumentalist to adjust for this difference, but the conductor continuously evaluates this ability by checking the results

for vertical linearity. In the example here, the results clearly produce a poor attack.

Example 2

The passage (Gounod, 48) is for the entire brass section, at a slow tempo; in a sequence of three attacks, each one is produced with a defective attack.

In any passage involving brass attacks together, a problem of vertical linearity may be anticipated by the conductor due to the variety of speaking-times inherent in the performance of each type of instrument. The problem is compounded when the basic tempo is slow; since the type of beat customarily employed for slow attacks also requires a slow preparatory motion, the conductor must check the actual performance of such attacks for this type of defect. The players' problem is to identify at exactly what point of the visual beat they are expected to commence their sound; their degree of precision is usually less when the beat itself is slow. The first warning to the conductor of such defects may be signaled if he detects that each of the attacks seem to have a slightly different quality.

Example 3

The tempo is not clearly established by the first two moving notes in this excerpt ("Alma Llanera," 25) due to the defective quality of the initial attack, in which the violins anticipate the proper moment.

This defect can be clearly detected by the conductor who will measure aurally the comparative length of time occupied by the first four notes of the passage. In retrospect, after hearing the passage as recorded here, the conductor will note that the passage consisted of equal eighth notes which, upon measurement, turn out to be unequal in performance.

Example 4

Here (Tschaikowsky, 80) the trumpet is too early on the attack following a slight ritardando in the solo contralto voice.

Such defects on the part of the trumpet are relatively easy to detect, since the instrument projects with a clarity that is difficult to ignore. There is no inherent rhythmic problem here; the defect is simply that of the trumpet anticipating the passage for full orchestra. The result is clearly audible.

Example 5

The final attack in this passage (Tschaikowsky, 80) is mushy, without the full and precise weight of a properly co-ordinated attack.

The defect is precipitated by the delay immediately preceding the final attack. Such delays are traditionally valid and artistically acceptable, but the conductor must be aware that they do pose problems for the performers and be

prepared to evaluate each such delayed final attack for the type of defect illustrated in this example.

Example 6

In this passage (Bellini, 28) a sequence of two groups of three quarter-note chords each, in tempo, is separated by a quarter-note rest. On the first note of the second sequence, one or more violins anticipate the entrance.

It is almost axiomatic that when the music flows continuously it is more difficult to detect deficiencies in vertical linearity than on those occasions where the flow is interrupted by rests. Each such rest represents a potential opportunity for lessened precision; the conductor must particularly examine for defects each of the many such moments which are a part of most compositions. Against the background of silence implied by the rests, defects stand out with special clarity, and must be identified and located by the conductor.

Example 7

A series of three chords for woodwinds and French horns, recurring three times, occurs in this passage (Bellini, 27). The first series is acceptable, the second shows a slight weakness and indecision, and the third is quite due to the late entrance of the French horn.

This passage of nine chords offers nine opportunities for non-linearity within the space of sixteen seconds.

The conductor will find this particular defect relatively easy to detect because of the difference in tone quality between the French horn and the woodwinds. Such a defect is common in the production of the French horn sound when the volume level is relatively low, as it is in this passage. Remediation on the part of the conductor can take the form of making certain to provide a clear beat for the benefit of the players, even though the beat itself may not properly be vigorous. Hesitancy or indecision in the conductor's beat can lead to this type of defective attack.

Example 8

The attack for low brass is defective in this excerpt (Richard Strauss, 78).

The conductor and players share the possible blame for the source of this defect. It may be caused by the inability of the players to judge correctly the proper amount of lead-time necessary to compensate for the speaking-time of their respective instruments, or the defect may have been caused by a poor visual beat on the part of the conductor.

Example 9

The attack here (Dvorak, 39) is scored for flute and two oboes; the flute is clearly early.

Precision among only three performers should be a relatively easy matter to evaluate. This particular combination of double reeds and flute is especially vulnerable to

poor attack, due to the difference in speaking-time between the two types of tone production used in their respective performance. The flute usually tends to speak earlier than the double reeds, and this tendency should be carefully checked by the conductor, especially in an initial attack, such as that presented in this example.

Example 10

The first trumpet releases late on one passage here (Mangione, 56), extending his sound after the remainder of the group has established silence.

From the point of view of conducting technique, attacks in passages such as this are more easily controlled than the releases, since the releases are not governed by the same precision of movement as the attacks. Such releases are, rather, almost always a matter of verbal (or perhaps non-verbal) agreement at rehearsals. Therefore, conductors will tend to evaluate attacks more easily than releases until they are instructed (or learn for themselves) otherwise. Releases should always be evaluated specifically.

Example 11

In this passage (Pederson, 64) of a sequence of three chords and their resolutions, plus a final three chords, the oboe is uncertain--entering early on the first group, properly on the second and third groups, and early on the final three chords.

Flagrant defects such as these are likely to be the result of an improper technique on the part of the conductor. Therefore, in evaluating this defect, the conductor should examine first the precision of his own beat, which includes concentration on the coordination of the beat with the resultant sound expected from the performers. Having made certain of his own performance, the conductor may then suspect the skill of the performer if the defect persists. Detection of this type of poor attack poses little problem for a conductor; remediation is more difficult.

Example 12

Here (Verdi, 84) the passage consists of a set of three final chords of a set piece. The conductor prefers to delay the final chord very slightly, whereupon one violinist makes the final entrance too early.

The conductor can be alert to the possibility of such a defect if visual contact is not maintained with every performer at such moments. Detection of the error is simple, since the single instrument is heard a fraction of a second before the remainder of the group.

Example 13

This example (Bellini, 27) consists of a series of repeated chords for the full orchestra. At one point at least one bass viol fails to release properly, and the final full attack is poor.

Stated differently from previous discussions with regard to releases in this unit, attacks are more easily evaluated for precision than are releases. One reason for the difference is that attacks are usually preceded by silence. Releases, on the other hand, are somewhat blurred by the decay-time which is a function of the particular acoustics in each concert hall. Therefore, the conductor must devote more concentration to the evaluation of releases than he must for attacks; they are no less important, though perhaps less crucial, to proper vertical linearity. The conductor will find that the poor final attack in this excerpt is much more easily perceived than is the single poor release.

Example 14

The voice and instrumental ensemble produce a poor attack on this short passage ("Cocula," 36).

In compositions such as this the instrumental ensemble serves as an accompaniment to the vocal solo and, as such, may be expected to perform all the elements of the accompaniment at the same time, with vertical precision. In this excerpt, the voice anticipates the instrumental ensemble itself, though it may be said as properly that the ensemble's entrance is late. In either case, the defect is apparent, and so is its source.

Example 15

The brass section does not release the sustained chords together in this example (Gounod, 48).

Brass instruments, with their relatively powerful sound, produce even more of an acoustic overhang than do the other individual sections; brass releases, therefore, are difficult to detect in such circumstances.

Example 16

A recitative passage (Bellini, 27) contains one poor attack from the full string section here, and an even more obvious defect in an isolated single chord where one string player fails to release properly.

The relative ease with which this particular defect in release can be detected is due to the comparatively reduced acoustic overhang produced by the quiet performance of the strings in this passage.

Example 17

This passage (Tschaikowsky, 80) contains a sequence of three French-horn attacks, the first by a single horn, the second by three horns, and the third by the entire French-horn section. On the second attack, the two additional French horns do not attack properly with the first horn.

In a phrase such as the one presented for this example, in which the first note does not contain rhythmic

elements, the conductor must provide the missing ingredient by means of his own technique, evaluating the second entrance by its coincidence with his own beat. The conductor can determine in that manner that the requirement of vertical linearity was not met in the performance of the second chord.

Example 18

The triangle and tambourine are both late in this allegro 3/4 passage (Verdi, 84). Even though those two instruments are required to play only on the downbeat of each bar, they are apparently receiving rhythmic reinforcement from each other. Because of that effect, they are playing their own sounds together, but at variance with the remainder of the ensemble. Evaluation by the conductor should be by matching the percussion sounds against the very regular and precise sounds by the remainder of the orchestra in this excerpt.

Example 19

The bassoon is late in this excerpt (Dvorak, 39) on the woodwind entrance following the English horn solo.

Often no amount of care on the part of the performer with regard to establishing the proper lead-time to compensate for speaking-time variables can help, if the instrument itself is momentarily at fault. In this example, it may be suspected that the reed would not speak immediately,

producing this easily-detected defect in attack.

Example 20

There is a defective oboe attack on the first long note after the passage begins (Brahms, 32).

Again, as in Example 21, it may be suspected that the reed itself is at fault rather than the performer. In either case, however, the result is a defective attack.

Example 21

Here is an introduction for full orchestra (Bellini, 27) in which the defect involves both poor attacks and poor releases from the strings, as well as rhythmically uncertain timpani performance.

These defects are difficult to detect, but they contribute nonetheless to a generalized muddiness of sound which is not properly a part of an ideal performance. Repeated hearings of this example, though, will enable the conductor to identify the sources of the imprecision.

Example 22

A pizzicato chord in this excerpt (Weber, 85) underlining the woodwind dominant-tonic cadence is too early.

The tendency of the relatively dry pizzicato sound to speak more quickly than the woodwinds in such a progression can alert the conductor to listen to such a passage with special care, anticipating possible defects in attack.

Remediation can lie in the necessity for the conductor to give a precise beat so that both the strings and the woodwinds will be able to judge the correct moment to begin their tone production.

Example 23

This excerpt (Gounod, 48) contains a series of evenly-spaced slow brass chords, in which the attack by the tuba is ill-timed.

As the largest of the brass instruments, the tuba must be checked carefully by the conductor to make certain that the instrument is sounding at the proper instant together with the rest of the ensemble. Capable performers on the tuba will have learned about the time-lag inherent in making the instrument speak correctly; those who have not mastered the timing will be likely to produce this type of defective attack until the situation is brought under control through the combined efforts of the conductor and of the players concerned.

Example 24

This is an excerpt (Bellini, 27) for soprano, tenor, and baritone, with string accompaniment. At a fermata immediately preceding the final chord, the voices release together, but one or more string continue, releasing finally at random.

A defect such as this, where comparatively large

groups of instrumentalists release defectively, is likely to be the product of a defective conducting technique. The conductor must be aware, then, of the necessity to indicate the release precisely (which is technically possible in this particular excerpt); the performers seem not to know the precise moment when they are expected to release.

Example 25

This excerpt (Tschaikowsky, 81) contains a passage for unison trombones which contains one defective attack.

The incidence of bad attack from the trombones is not likely to be greater than that involving other instruments, at least when the passage requires loud performance, as in the case of this excerpt. Such defective attacks are easily detected, however, and there is no possible doubt about the existence or location of this one.

Example 26

This is a passage (Bellini, 27) in which the orchestra establishes an acceptable tempo; both the timpani and trumpets produce attacks at variance with the established tempo.

One of the few examples in this unit in which the difficulty can be traced to a faulty technique over the entire passage, the performance here demonstrates that consistently poor attacks on the part of the trumpets can lead to a type of general disorganization usually associated in

this unit with a Type 1 defect. Yet, the problem is clearly one of defective attack.

Example 27

The attack at the commencement of the new tempo in this example (Tschaikowsky, 80) is mushy, though the sequential attacks following are acceptable.

Attacks occurring at the commencement of a new tempo are special candidates for evaluation by the conductor and present special difficulties for the orchestral players, related to their own individual abilities and the skill of the conductor.

Example 28

This excerpt ("Cocula," 36) involves setting a new tempo abruptly; the violins are ahead of the remainder of the ensemble.

Although this type of relatively informal musical group operates without a conductor as such, musical responsibility for proper ensemble should not be abdicated. By whatever method of control, vertical linearity is always appropriate. (It should be noted, though, that this requirement may not be essential in certain types of modern jazz or unconventional avant-garde music not considered in this unit.) Nevertheless, the critical conductor must develop the ability to detect defects in any kind of conventional music purporting to maintain vertical-linearity,

of which this excerpt forms an example.

Example 29

A release defect exists here (Verdi, 82) in which the oboe extends beyond the remainder of the woodwinds in this brief series of four eighth notes followed by a quarter note.

This defect is likely to be the result of a simple disagreement on the exact length proper for the final note of the phrase. Conductors must be alert for such disagreements among players, even on the briefest of passages, since the very brevity of a passage can sometimes lead performers to concentrate on the entrance following the release, rather than on the release itself.

Example 30

The fifth note in this melodic series for woodwinds (Richard Strauss, 78) is tentative; the volume increases as the additional instruments which enter at this point become more certain of their attacks.

This attack is ideally pianissimo and should remain so for its duration. Proper attack includes the responsibility of the player to begin the tone production at the proper volume level, and not at a level below which he is able to sustain the tone that follows the attack.

Example 31

In this excerpt (Dvorak, 39) the series of chord progressions in the high woodwinds require accurate releases; the flute carries over in most cases, not matching the releases of the other woodwinds.

Although perhaps a matter of individual technical proficiency on the part of the first flute, the conductor may also suspect that the defect arises from a basic disagreement on the exact nature and timing of the release. If the conductor clearly communicates his intention regarding the releases, he may evaluate it by listening for a training-away of the end of each chord (as occurs here), rather than an immediate cessation of sound by each member of the group at the proper moment.

Example 32

The first violin produces defective releases on this short final passage ("El Guaco," 40), permitting his instrument to sound after the others have stopped.

Agreement with regard to release may be more difficult in this conductorless ensemble, but no less important. The disagreement represented here is clearly audible.

Example 33

In this excerpt (Brahms, 32), the ensemble is satisfactory until the point at which the conductor holds back

the tempo slightly; one clarinet anticipates the delayed note slightly.

If the conductor alters the tempo intentionally, he must be prepared to identify defects in attack produced by those performers who have not maintained proper contact with the intentions of the conductor at that moment. This particular defect was produced by a player who was still playing at the tempo established by the conductor at the beginning of the passage.

Example 34

A defective attack between the oboe and flute occurs in this introductory passage (Bellini, 27).

The tempo is quite slow, marked by eighth-note triplets occurring on each quarter beat of the 4/4 measure. The strings playing these triplets are not precisely together, causing some doubt to the woodwind soloists as to the proper timing of the soli entrance. The difficulty of the attack is amplified by the slow tempo.

Example 35

This moderate 3/4 passage (Shostakovitch, 72) requires the French horns to enter on the second beat in each of four successive measures. The attacks by the entire French horn section are defective.

In any situation involving unison attacks of the French horns where the harmonic voicing is comparatively

wide, the conductor must evaluate especially for precision of attack. Since the speaking-time for those instruments playing the lower parts is slower than for the upper instruments, the section attack becomes more difficult. Wide spacing of French horn voicing must alert the conductor to the special possibility of defective attacks.

Example 36

At the end of the movement (Dvorak, 39), the repeated tonic chords, unevenly spaced rhythmically, are unsuccessful due to the early entrance of one or more violins on the third of the seven final chords.

Unevenly spaced final chords often trap unwary performers into undesirable anticipation. Some performers may also be careless enough to be late, but the sound of the large group of players masks this type of defect beyond the aural detection of the conductor in most cases. To evaluate early attacks, the conductor must listen for a solid block of sound on each such attack, discerning defects by identifying the fraction of a second lack of solidity which occurs when such chords are improperly performed.

TYPE 3 DEFECTS

Example 1

A melodic line in the clarinets (Richard Strauss, 76), is doubled by the baritones one octave lower; they

begin the passage slightly behind the clarinets and lose further ground as the passage progresses.

An entire section and voice (the baritones) begin incorrectly, and the degree of defect increases, causing the two voices to sound at increasingly divergent tempos, though each group is together within itself. The conductor will be able to detect this problem in an ensemble by his inability to check the tempo mentally by comparing it with either of the divergent voices, without causing simultaneous interference with the checking of the other voice.

Example 2

There is an unmotivated, abrupt change of tempo in this march (Texidor, 79), occurring between the fourteenth and twentieth measure.

Few marches are intended to be performed at a mechanical tempo throughout; changes of tempos in marches, however, usually relate in some way to the musical values of the composition. This particular example demonstrates loss of control on the part of the conductor at the point where the tempo changes suddenly.

Example 3

This eight-measure excerpt (Bellini, 28) contains a slight accelerando which the orchestra negotiates successfully; the chorus does not make the same degree of accelerando at the same time.

Direct (if not radical) changes of tempo present difficulties in ensemble performance; gradual changes of tempo are sometimes more difficult. At a direct tempo change, performers can usually be relied upon to be watching the visual beat closely, whereas in gradual changes of tempo there is a tendency to rely less on the visual beat and more on whatever clues are provided by the total sound surrounding each player at the time. It is therefore imperative that the conductor evaluate the attention of his group during any gradual change and, at the same time, be alert at such moments for any divergence of opinion which results in defects such as that represented in this example.

Example 4

This solo for accordian ("Frula," 46) is accompanied by a group of rhythm instruments who do not manage vertical linearity at all times, though the degree of integration varies throughout the excerpt.

Although this group plays without conventional conductor, vertical linearity is still a requirement of this type of music. The very considerable speed of this excerpt makes it difficult with regard to technique for the rhythm instruments to maintain precise ensemble; the frequent phasing-in and phasing-out of the proper tempo experienced by the rhythm instruments are probably a function of the extremely fast tempo taken by the soloist, and the inability of the other members of the group to establish functional

time-belts of their own which can operate at that speed. The conductor may expect to find under these conditions that compositions played at very high speed, involving even the simplest of accompanying rhythms, may be difficult to control.

Example 5

In this 3/8 passage (Bizet, 29), the tempo is well-set and steady until the point at which the first violins take the melody; the violins then begin to play early on each successive note.

Since the tempo was correctly set before the entrance of the violins, it seems unlikely that the defect arises from not listening to the previously set tempo or from not watching the conductor. A more rational explanation is that this excerpt is an example of a tendency sometimes found among individual string players to feel more comfortable in playing each successive note a fraction of a second before the others, thus enabling him to hear himself for just that brief moment. The net result is that the entire section sometimes gets caught up in the procedure, playing earlier and earlier as the passage continues. This is clearly a phenomenon different from that of playing faster and faster, or rushing. It is related, rather, to the tendency of some individual string players to play sharp in pitch on occasion. Just a minute degree of sharpness allows the player to hear himself more clearly, though

such tendencies can have a cumulative effect in any individual performance to the point where the critical conductor can say, in summation, "the strings are sharp."

Example 6

In this march ("March," 58), the band plays a lengthy introduction to the entrance of a chorus. The chorus and band remain well-coordinated for a time, then the chorus gradually begins to sing ahead of the band; at the climax of the excerpt the chorus is approximately one-half beat ahead of the band.

Singing groups often present problems of rhythmical precision and vertical linearity when performing with accompanying instrumental groups. Although choruses are often also behind the beat, this example illustrates an occasion on which they are ahead. Probably caused by the lessened ability of any individual singers in such a group to hear the accompaniment clearly (due to the immediately surrounding body of vocal sound), they must then rely chiefly on visual contact with the conductor's beat. Such contact may have been lacking in this particular excerpt, producing the defect under consideration.

Example 7

The preceding musical material sets the tempo adequately (Shostakovitch, 72), but the passage is disrupted by rushing of the trumpets at their entrance.

Any groups of instruments entering into a passage in which the tempo has already been set must be evaluated instantly by the conductor to determine that the desired tempo was continued successfully. In this case, it was not.

Example 8

This example (Shostakovitch, 73) involves a direct change of tempo from an allegro to an allegro molto. At the tempo change, the strings and French horns are required to set the tempo together; in this performance the strings and French horns set different tempos for the space of one measure.

Direct changes of tempo should be particularly evaluated by the conductor for the type of defect illustrated here. The problem in this example is that of the two groups of performers involved interpreting the new tempo in different ways; the result is not at all uncommon. Remediation can take the form of the conductor's insistence that all members of the ensemble watch the second beat of the new tempo, since only the elapsed time between the first and second beats of the new tempo communicates any information to the players regarding the third and successive beats.

Example 9

This march (Fillmore, 45) suffers an abrupt reduction in tempo at the seventh measure.

The tempo change is unmotivated; there is no musical

reason to explain the abrupt character of the reduction in tempo. The reduction can be explained in terms of the problems of ensemble control. Note that in this case the reduction occurs after an introduction which is marked both by a dimenuendo (often a prelude to an unwonted reduction in tempo) and the absence of clear rhythmical elements; in the introduction. The conductor should be alert to combinations of those two circumstances, since either of them can lead to a momentary loss of rhythmic precision on the part of the performers, leading to this type of defect.

Example 10

The high woodwinds get progressively behind in a passage (Chopin, 33) involving a sixteenth-note rest, followed by three slurred sixteenth notes, the combination repeated nine times.

As noted in other examples in this unit, rhythmic figures beginning with rests of less than one beat in duration are often susceptible to misperformance. When the rhythmic figures of that type are repeated (as in the nine times illustrated by this excerpt) the misperformance tends to be cumulative, resulting in a departure of an entire section, the high woodwinds in this case, from the established tempo. Note that the woodwind section in this excerpt is in good ensemble with itself; the problem is in its relationship to the remainder of the group.

Example 11

This passage requires strict and unvarying rhythm (Weber, 85), but at the final cadence the brass anticipates the final chord at the final downbeat.

The conductor must check the occasional tendency of musicians (apparent in this excerpt) to anticipate the final downbeat. The tendency may arise from a desire on the part of the players not to be late; it may also arise from the same tendency on the part of the conductor, who may produce the final beat too early. In either case, the time-belt of even quarter notes is the governing factor, and the conductor should conduct (and evaluate the performance of his players) against those even quarter notes.

Example 12

An unmotivated, abrupt change of tempo occurs in this march (Kenny, 51) at the ninth measure.

The defect occurs after a four-measure dimenuendo, where an unmotivated reduction tempo is often likely to occur. The conductor must make certain that the sense of meter governing his physical movements prevent such a reduction. He must also check the tendency of the group (demonstrated in this excerpt) to regain the original tempo after the dimenuendo. Similar passages should always be evaluated for this type of defect.

Example 13

In this march ("March," 57), there is an unmotivated

direct change of tempo at the fifth and sixth measures.

With the exception of certain purposeful and meaningful distortions, marches may generally be assumed to require performance at a comparatively steady tempo. The conductor must evaluate the continuing tempo against his own established time-belt, classifying as a defect any marked variation from the tempo he has set.

Example 14

A section of a waltz movement, this excerpt (Delibes, 38) illustrates an unmotivated gradual increase in tempo.

Waltzes, commonly conducted in one beat to the measure, are often subject to this kind of aberration, caused, in this case, by the comparatively long space of time between the visual downbeats, without any intermediary visual beats (on the unstressed beats of the measure) to serve as rhythmical guideposts.

Example 15

This 3/4 passage (Gounod, 48) contains a series of nine brass chords occurring at supposedly equal intervals of time; the ninth attack comes approximately one beat too early.

At any climax contained in such a passage, the conductor must check any tendency on the part of the players (and himself) to reach the climax too early. This phenomenon of early climax is quite common in ensemble performance.

The conductor must be prepared to evaluate any such passage for defects of this particular nature.

THE PRETEST-POSTTEST

As noted earlier, the test was constructed from an initial pool of 150 items chosen for the study. It covers the differential content of the instructional unit (the three types of deficiencies) in approximately the same proportions as the unit: 25 items for Type 1, 17 items for Type 2, and 8 items for Type 3.

The musical material of the test took approximately 36 minutes. Each excerpt was played three times, with 20 seconds of silence between each playing of each excerpt, and between each excerpt and the next. Although real-life deficiencies occur at unpredictable intervals and present the necessity of immediate response on the part of the conductor in most cases, it was felt that in a test situation a total of at least one minute should be allowed for proper response to each item. Holding the time constant (to three 20-second intervals) provided the subjects with the opportunity to pace themselves as they responded to the items. Administration of the entire test took 85 minutes.

The subjects were instructed to avoid non-specific terms and to concentrate their efforts on detecting when a deficiency had occurred, locating it, and then describing it adequately, being as precise as possible. The one minute

response-time for each item was imposed only for administrative purposes.

Each of the 50 items was scored from zero to two points according to the correctness and specificity of the response, making a total of 100 points for the full test.

To aid objectivity in scoring, the pretest and posttest were scored at the same time. All identification as to whether each test blank was in fact a pretest or posttest was removed, as was the name of the subject, replaced by a code number.

Reliability of the test was estimated by the test-retest method at .76 by product-moment correlation between the control group pretest and posttest.

A description of the 50 test items follows. Since these items were not discussed in the instructional context, only the description of the deficiency itself is included. This section served as a scoring key for the tests.

THE TEST

Defects exist in each recorded test item as noted; this list of defects served as a scoring key.

Item 1

This excerpt (Bellini, 27) illustrates a Type 1 defect which contains a series of recitative chords for strings, in two groups of six notes each, entering after

an unaccompanied passage for tenor. The first series is acceptable; the second series is marred when one or more violins enter approximately one sixteenth note prior to the remainder of the orchestra, remaining thus for the first three chords of that group. The final three chords are again acceptable.

Item 2

This excerpt (Delibes, 38) illustrates a Type 1 defect in which the orchestra begins together, but at the ritenuto the timpani plays progressively later over a series of seven quarter notes, producing much more of a ritenuto than the remainder of the orchestra.

Item 3

This excerpt (Bizet, 31) illustrates a Type 1 defect in which the tambourine, in playing afterbeats in 3/4 time, is consistently late.

Item 4

This excerpt (Brahms, 32) illustrates a Type 2 defect and is a passage in which several attacks are played within a very slight ritardando. A single clarinet player anticipates one of the attacks, producing a defect.

Item 5

This excerpt (Richard Strauss, 76) illustrates a Type 3 defect with a passage in which strict rhythm is

necessary in the quarter notes. To the contrary, the final two quarter notes are spaced too-closely by the timpani.

Item 6

This excerpt (Brahms, 32) illustrates a Type 2 defect in which a trombone chorale is defective due to a disagreement among the three solo trombones. The difficulty centers in the second and third trombones.

Item 7

This excerpt (Massenet, 60) illustrates a Type 1 defect in which the triangle is expected to play the identical rhythmical figure of the woodwinds, and can be distinguished clearly as behind the beat.

Item 8

This excerpt (Mozart, 63) illustrates a Type 1 defect in which, during a passage of sixteen measures in 2/4 time, the tempo is never set adequately.

Item 9

This excerpt (Bellini, 28) illustrates a Type 2 defect in which the final chord of a set piece is made defective by the timpani, who fails to release properly.

Item 10

This excerpt (Prokofieff, 65) illustrates a Type 3 defect in which the tempo is well-set by the accurate eighth

notes in the strings over an introductory phrase. At the entrance of the solo violin the tempo changes, the orchestra going one way, the solo violin another.

Item 11

This excerpt (Delibes, 37) illustrates a Type 2 defect in which the character of the attacks within the orchestra are such that there is no consensus of the proper tempo in the ensemble.

Item 12

This excerpt ("Fanfare," 43) illustrates a Type 1 defect in which the second trumpets enter the ensemble at the incorrect moment, causing the remainder of the passage to be imprecise throughout the ensemble.

Item 13

This excerpt (Tschaikowsky, 80) illustrates a Type 1 defect in which the passage containing fast sequences of two eighth notes each, alternating among various instruments through the orchestra. The sequences are not successfully articulated, some players playing too soon, some too late, some too fast, and some too slowly.

Item 14

This excerpt (Dvorak, 39) illustrates a Type 2 defect in which the introductory passage is particularly ill-performed by the brass, who produce only three acceptable

attacks out of the first seven.

Item 15

This excerpt (Bellini, 27) illustrates a Type 1 defect in which, during an aria for tenor and orchestra, having the high woodwinds in octaves with the tenor, the woodwinds are not together with the tenor at the ascending scale passage.

Item 16

This excerpt (Tschaikowsky, 81) illustrates a Type 1 defect in a passage marked by strong rhythmic figures, against which are set off-the-beat responses by the brass and tambourine. As the passage proceeds, the brass/tambourine combination becomes progressively later.

Item 17

This excerpt (Verdi, 82) illustrates a Type 3 defect. The orchestra sets the tempo precisely at the beginning of an aria for tenor. The tenor enters correctly, but after two measures the tenor begins to sing more slowly than the orchestra plays. Orchestra and tenor become separated by as much as an entire beat.

Item 18

This excerpt (Richard Strauss, 76) illustrates a Type 1 defect. The clarinets and baritones have a passage intended to be in octaves with precise vertical linearity; the baritones lag behind the clarinets in this performance.

Item 19

This excerpt (Delibes, 38) illustrates a Type 1 defect in which, during an antiphonal passage of three sequential rhythmical figures, the brass and percussion tend to be late during their first two sequences.

Item 20

This excerpt ("El Gusto," 41) illustrates a Type 2 defect in which the initial note is poorly attacked by the violins.

Item 21

This excerpt (Bellini, 27) illustrates a Type 2 defect. At the climax of the flute and oboe solo in octaves, the remainder of the woodwinds enter at variance with one another, producing a defective attack.

Item 22

This excerpt (Verdi, 83) illustrates a Type 3 defect in that the chorus and orchestra are not together over the entire excerpt, taking two different tempos rather than sharing one.

Item 23

This excerpt (Lalo, 52) illustrates a Type 1 defect. Solo violin and violoncellos and bass viols, two octaves apart, are intended to play the melodic lines with vertical linearity; here the low strings lag behind the solo violin.

Item 24

This excerpt (Verdi, 83) illustrates a Type 2 defect in that the beginning of the passage contains poor low brass attacks, not together with the attacks of the trumpets.

Item 25

This excerpt (Dvorak, 39) illustrates a Type 2 defect in which the progression of three half-note chords for the winds is marred by the early entrance of the first French horn on the final chord. Additionally, releases on the first two chords are uncertain.

Item 26

This excerpt (Marquina, 59) illustrates a Type 1 defect in which the tempo is well-set by the entire orchestra, but at the second phrase the brass enter too late on a fanfare-like passage beginning with an eighth-note rest.

Item 27

This excerpt (Schubert, 70) illustrates a Type 1 defect at the opening passage. The lower strings are not coordinated with regard to the new tempo set by the first violin.

Item 28

This excerpt (Respighi, 68) illustrates a Type 1 defect on the part of the tambourine, who is late in the performance of this passage.

Item 29

This excerpt (Dvorak, 39) illustrates a Type 2 defect in which the clarinet and bassoon are expected to attack together, but the bassoon is clearly late.

Item 30

This excerpt (Brahms, 32) illustrates a Type 3 defect. The passage begins with the rhythm well-established, then degenerates in several directions during a passage for solo oboe with syncopated figures in the trombone. The situation is complicated by the entrance of the second oboe, who is faced with the momentary choice of following the first oboe, the trombone, or the conductor.

Item 31

This excerpt (Lalo, 52) illustrates a Type 1 defect in which the entire orchestra is late on the entrance following a fast 6/8 (in two beats to the measure) ascending scale for the solo violin in sixteenth notes.

Item 32

This excerpt (Marquina, 59) illustrates a Type 1 defect in a brisk 2/4 allegro passage of three and one-half measures, wherein the strings, together with the rhythm instruments (guitar and percussion), set the tempo successfully with the simple downbeat-afterbeat formula. The woodwinds enter on the last half of the fourth bar, but with

the first two eighth notes at a tempo markedly slower than that set by the introductory material.

Item 33

This excerpt (Bellini, 27) illustrates a Type 1 defect. The passage from an aria for tenor in which the tempo seems well-established and agreed-upon is marred by a ritardando, at which point the orchestra is divided on the exact nature of the slowing-up, with the tenor going in still a third direction.

Item 34

This excerpt (Bellini, 27) illustrates a Type 1 defect in an aria for tenor. The tempo is well-established until immediately prior to the final cadence, at which point a descending triplet figure is marred by some rhythmical variance in the woodwinds.

Item 35

This excerpt (Brahms, 32) illustrates a Type 2 defect with an attack from the entire group which is unsubstantial and inexact.

Item 36

This excerpt (Tschaikowsky, 80) illustrates a Type 1 defect in which the five chords for full orchestra at the end of the recorded phrase are not together.

Item 37

This excerpt (Mozart, 62) illustrates a Type 2 defect. The initial attack is preceded by a premature entrance on the part of one or more violins.

Item 38

This excerpt (Holst, 50) illustrates a Type 1 defect in which (in the third measure) the snare drum is behind the remainder of the ensemble.

Item 39

This excerpt (Weber, 85) illustrates a Type 1 defect in a series of three dominant-seventh to tonic chord cadences, the resolutions are not together.

Item 40

This excerpt (Weber, 85) illustrates a Type 1 defect. In a strict 3/4 waltz passage the afterbeats in the brass are sluggish.

Item 41

This excerpt (Tschaikowsky, 80) illustrates a Type 2 defect with a single violin entering too early on the final attack of the passage.

Item 42

This excerpt (Shostakovitch, 71) illustrates a Type 2 defect in which the initial attack by the trumpets is defective.

Item 43

This excerpt (Shostakovitch, 72) illustrates a Type 1 defect in which the two solo flutes, in a slow 4/4 passage consisting of quarter notes and eighth notes, perform the quarter notes well-together, but do not coordinate the eighth notes acceptably.

Item 44

This excerpt ("El Tirador," 42) illustrates a Type 2 defect. The initial attack is defective in that several of the instruments enter at varying moments.

Item 45

This excerpt (Tschaikowsky, 80) illustrates a Type 3 defect. The chorus, with orchestral accompaniment, begins and continues successfully for half the length of the excerpt, with the tempo well-set by the orchestra and accepted adequately by the chorus. At the ninth measure, the ensemble is disrupted by a sudden divergence of the chorus into a new tempo of their own.

Item 46

This excerpt ("Las Copetonas," 53) illustrates a Type 2 defect in which the trumpet releases defectively on the final three chords of the passage.

Item 47

This excerpt (Gould, 47) illustrates a Type 1 defect. The timpani and snare drum are behind the remainder of the

ensemble in this series of four measures, 4/4 time, consisting of regular triplets.

Item 48

This excerpt (Respighi, 67) illustrates a Type 3 defect in a passage in which the French horns have (in 2/4 time) a recurring figure consisting of an eighth-note rest followed by three staccato eighth notes. The passage begins successfully, but the French horns begin almost immediately to lag behind (though together as a section), ending the passage out of contact with the remainder of the group.

Item 49

This excerpt (Delibes, 38) illustrates a Type 2 defect. The attack on the final note of the final measure is defective.

Item 50

This excerpt (Tschaikowsky, 80) illustrates a Type 3 defect. The passage is a brisk 2/4 allegro, the orchestra sets the tempo adequately. The entrance of the chorus contains a marked departure by that group from the tempo already set in the orchestra. The result is that both the chorus and orchestra are together with themselves, but not with each other.

Chapter 4

PRESENTATION OF FINDINGS

The null hypothesis was used to determine whether the instruction received by the experimental group (the instructional unit) would result in a statistically significant improvement in that group's ability to detect and identify performance deficiencies associated with three types of distortions of vertical linearity, as compared with the ability of the control group on the same tasks, having received a placebo-type treatment representing the effects of the traditional curriculum which is concerned only indirectly with detecting and identifying those performance deficiencies.

The null hypothesis was that no statistically significant difference would be observed as a function of the two types of treatment.

Mean scores of the control group and experimental group are summarized in Table 4. Total possible score was 100.

Table 4

Control Group and Experimental Group
Mean Pretest-Posttest Scores

	Control Group		Experimental Group	
	Pretest	Posttest	Pretest	Posttest
MEAN	36.08	40.70	39.73	61.52
S.D.	8.35	7.61	7.23	5.24

Mean gain-score of the control group was 4.62 points; mean gain-score of the experimental group was 21.79 points.

It was determined that the data were correlated ($r = .61$, which is significant beyond the .01 level). Testing the variances of the two groups for homogeneity, the computed F ratio of 2.09 suggested homogeneity of variances at the .02 level of confidence. The data were then subjected to a $\underline{t}$ test model for equated groups (Popham, 9, 154-158). The resultant $\underline{t}$ value of 2.54 was significant beyond the .01 level, with 44 degrees of freedom.

Standard error of the mean for the experimental-group posttest mean was 8.2; the 99% mean-difference confidence limits lie at the scores of 40.36 and 82.68.

As the study was originally conceived, it was hoped that meaningful data would be developed and analyzed relating to the three subtests which constituted the full test. However, because of the relatively small final number of test items for each subtest (25 Type 1 items, 17 Type 2 items, and 8 Type 3 items), only a superficial analysis can be made regarding the relative pretest-posttest position of both groups on each subtest. However, it can be noted (in terms of percentage of correct responses, without inappropriate further analysis) that the following data was obtained for each subtest, summarized in Table 5.

Table 5

Relative Position of Both Groups on the Subtests in Terms of Percentage of Correct Responses

Subtests	Control Group Pretest	Control Group Posttest	Experimental Group Pretest	Experimental Group Posttest
Type 1	31.92	37.66	36.18	61.56
Type 2	36.76	37.05	39.26	56.90
Type 3	47.62	57.81	51.87	71.81

Although it was initially hoped that a sufficient number of subjects would be available for the study to make meaningful analysis possible on the year-in-school variable, the final number of subjects participating in each group at each level (see Table 1) made further statistical analysis inappropriate.

However, with appropriate caution regarding statistical inference, a summary of full-test mean scores at each year-in-school is presented in Table 6.

It can be noted that each year-level of the control group (as well as the experimental group) did produce on the posttest a higher mean score than on the pretest. This gain may have been attributable to the practice effect of the pretest, and possibly to intra-session history, which may have included some control-group-experimental-group verbal interchange.

Table 6

Full-test Subgroup Mean Scores Categorized as to the Year-in-School Variable

Year-in-School	Control Group Pretest	Control Group Posttest	Experimental Group Pretest	Experimental Group Posttest
Freshman	32.33	34.00	35.33	54.83
Sophomore	34.28	40.86	41.29	66.14
Junior	35.60	38.60	40.00	58.25
Senior	42.33	49.00	42.16	65.00
Total mean	36.08	40.70	39.73	61.52

It can also be noted that the mean scores of both groups tended to increase as a function of year-in-school, with four exceptions. Examining the data for all but the experimental group, the general year-to-year increase in mean scores may indicate that some measure of the skills under consideration in this study is indeed imparted to many students by the traditional curriculum.

Finally, on all tests but the control-group pretest, it can be observed that the junior class mean score was somewhat lower than that of the sophomore class and, of course, the senior class; Table 1 reveals that the position of the junior class on the equating ACT-percentile-score variable was also somewhat lower.

The null hypothesis was that no statistically significant mean difference would be found to exist between the control group and the experimental group in the groups'

ability (to detect and identify performance deficiencies associated with three types of vertical-linearity) as a function of the differential treatments received by the two groups. The null hypothesis was rejected at the .01 level of confidence.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to determine whether a statistically significant difference could be observed in the ability of a group of music-teachers-in-training to detect and identify performance deficiencies associated with three types of vertical-linearity distortions as a function of an experimental treatment devised for the study, as compared with the treatment (the traditional curriculum) to which a control group was confined.

SUMMARY

The sample used in this study consisted of the 47 music-teacher-in-training members of the Southeastern Louisiana University Symphonic Band during the fall semester of the 1970-1971 academic year. The entire group was equated on the basis of year-in-school, sex, and ACT percentile scores, then randomly assigned to either the control group or experimental group. All of the members were required to participate; no mortality was experienced.

The treatment for the experimental group consisted of an instructional unit devised by the writer. The unit was taught verbally by the writer over a period of five one-hour

regular class meetings, utilizing 100 excerpts from musical recordings (86 percent from professional groups of nine types, 14 percent from advanced student groups) which demonstrated, in his professional judgment, distortions of vertical linearity of three types: a momentary distortion, a distortion due to deficiencies of attack and release, and a more extended distortion resulting in two or more disparate tempos, and an abrupt and unmotivated change in tempo. A limited musical context surrounded each deficiency.

During simultaneous sessions, the control group received a placebo-type treatment under the direction of a graduate assistant who restricted his participation to reading aloud the verbatim instructions of the writer to the control group. The treatment consisted of listening to musical recordings for the five one-hour class meetings, writing any comments they deemed appropriate about each composition. All responses were reviewed by the writer. The rationale for this "treatment" was in reality to allow the control group to demonstrate on the pretest-posttest the results of the traditional instruction presented by the University on the skills under consideration. The traditional curriculum at the University does not treat these skills in any direct, organized fashion; rather, many course-offerings in the curriculum are relied upon to impart this information to the students.

The pretest-posttest consisted of 50 items and was

constructed from a pool of 150 such examples of distortion isolated by the writer in developing the study. (The remaining 100 examples were used in the course of the administration of the instructional unit.) Administration of the tests took 85 minutes. The reliability of the test was estimated at .76 by the test-retest method.

The null hypothesis was used as a basis for the analysis, the data satisfied the requirements of correlation and homogeneity of variances, and were then subjected to a t test model for equated groups, yielding a t value of 2.54, which was significant beyond the .01 level. The null hypothesis was therefore rejected.

Because of the small number of items, no statistically significant conclusions were justifiable from treatment of the data yielded on the separate subtests which constituted the full test, nor was statistical treatment appropriate relating to the performances of the year-in-school subgroups among the subjects; the number of subjects in each year-in-school subgroup ranged from four to seven.

CONCLUSIONS

On the basis of the data yielded by this study, conclusions must be limited to the statement that the experimental treatment produced statistically significant results in terms of improving the ability of the students in the experimental group to deal with performance

deficiencies as specified on the three dimensions with which the unit and tests were concerned.

Familiarity with the data and procedures utilized nevertheless suggest several factors which can be commented upon in retrospect. These dimensions are in the nature of questions yet unanswered.

First, in spite of careful equation procedures, the experimental group did produce a pretest mean score 3.65 points higher than that of the control group pretest (see Table 4). The 99 percent fiduciary limits of the experimental group posttest mean, however, did not include the obtained experimental group pretest mean.

Secondly, the final length of 85 minutes for the administration of the pretest-posttest was felt, subjectively, to be overly long under the circumstances. (Musical material took 36 minutes, interspersed with 150 20-second intervals of silence to provide for writing the responses.) Time available for the study was necessarily limited, but the question must be raised as to whether the results might have been otherwise had the test been administered in two sessions.

Next, a close inspection of the exact nature of the performance deficiencies as described in the appropriate section in Chapter 3 reveals that a considerable proportion of the deficiency problems involved performers of the various instruments of the percussion family. Although this

weighting of deficiencies reflects what seemed to the writer only to be a comparable real-life situation, the possibility remains that an undeterminable number of successful responses on the posttests may have reflected a psychological set or perseverance on the part of the subjects, taking the form of, "when in doubt, blame it on the percussion." Unfortunately, this set would have been even more operant within the experimental group than the control groups (since the experimental treatment--the instructional unit--too, was weighted toward percussion deficiencies in approximately the same proportion). A more satisfactory procedure (though more artificial in a realistic sense) might have been to reduce the number of instructional-unit deficiencies attributable to the percussion instruments.

The matter of musical context is also important. Each deficiency example was necessarily presented (for instructional and administrative purposes) within less context than would surround similar deficiencies in real-life situations. Such relative isolation of each deficiency, then, did introduce some measure of artificiality into the procedure. As an instructional technique, however, such a procedure does include the first step which the conductor-teacher must himself take--that of detecting and identifying the deficiency itself. Future related studies might well consider providing substantially more context for each deficiency as well as the possibility of introducing some

musical examples in which no deficiency occurred. The present study has not answered the question as to whether students can be taught to detect and identify deficiencies in total context, without relative isolation.

Finally, it is by no means certain that adequate control was maintained for the Hawthorne effect. Again, time limits for the study made simultaneous sessions essential for both the control and experimental groups. Although the graduate assistant in charge of the control group cooperated, so far as can be determined, in establishing an interesting and seemingly worthwhile situation for the control group, it can probably be argued that the presence of the writer with only the experimental group (except for the pretest-posttest, which the writer administered simultaneously to both groups) may have occasioned some degree of the Hawthorne effect which was unmeasurable in the pretest-posttest-control-group design adopted for this study.

RECOMMENDATIONS

Since the dimensions of this study were necessarily limited by the setting in which it occurred, it must be considered exploratory and in no way exhaustive or definitive. Yet, so far as can be determined from the literature, the direct instruction on some of the more important variables with which a conductor-teacher necessarily deals at some time during every day of his professional career is not

routine. Resting perhaps on the philosophical problem of whether such direct instruction should be offered at some point in the music-education curriculum, the matter may be illuminated by further studies in the same area, with larger groups, perhaps, and more stringent controls.

In any case, practical considerations may limit the possibilities inherent in the teaching procedure itself. No related and appropriate textbooks now exist. There is no readily available pool of usable musical instructional items; each such instructional entity must be painstakingly (and knowledgeably) constructed by the experimenter himself. Yet, the raw material for such instruction exists in every collection of musical recordings. No ideal curricular space exists for such instruction within the traditional curriculum; yet, similar instructional units could be included in the context of any current course-offering. Not all music-education teachers may consider themselves adequately qualified to conduct such instruction.

A further interesting possibility, not original with the writer, is that of adapting the technique and materials to a self-instructional extra-class basis, reducing the necessity for curricular space and the essential presence of a live instructor.

It may also be of interest, though of little testable practical significance, to note subjectively the nature of student response to the experiment. In every case with

which the writer came in contact (and he admittedly would perhaps not come in contact with adverse reactions) the students claimed a markedly sharpened awareness of the problems posed by the types of deficiencies with which the unit and tests were concerned. These claims were still proffered (and to some extent demonstrated in daily musical contact) some two months after the experiment had been concluded. Similarly, there has been a demand from many members of the control group for a repetition of the instructional unit on their behalf, for its possible educational value to them.

As a practical measure, it is now planned that the instructional unit be administered in a teaching situation to each incoming freshman music-education class at Southeastern Louisiana University.

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87. DiFronzo, Robert Francis. "A Comparison of Tachistoscopic and Conventional Methods in Teaching Grade Three Music Sight-Playing on a Melody Wind Instrument." Unpublished Doctor's dissertation, University of Connecticut, 1966.

88. Hansen, Louis A. "A Study of the Ability of Musicians to Detect Melodic and Harmonic Errors in the Performance of Choral Music While Inspecting the Score." Unpublished Doctor's dissertation, University of Kansas, 1955.

89. Hartwell, Robert W. "A Pilot Study: A Study of the Ability of Music Student Teachers to Detect Errors in Instrumental Music Performance While Inspecting the Score." Unpublished Master's thesis, Ohio State University, 1965.

90. Hewlett, Rex J. "An Investigation of the Effectiveness of Two Methods of Student Response Using a Taped Program of Practice Materials for Improving Aural Discrimination." Unpublished Doctor's dissertation, Michigan State University, 1966.

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92. Sidnell, Robert G. "Developing Aural Perception in Student Conductors." Unpublished report, All University Research, Michigan State University, June, 1965.

93. Spohn, Charles L. and Poland, William. "An Evaluation of Two Methods Using Magnetic Tape for Programmed Instruction in the Elemental Materials of Music." Final report of Title VIII Project No. 876, NDEA of 1958, Grant No. 7-34-0430-72, Columbus: The Ohio State University Research Foundation, January, 1964.

E. MISCELLANEOUS MATERIAL

94. Official Adjudication Form, B-1, National Interscholastic Music Activities Commission, Washington, 1958.

F. TELEPHONE CONVERSATION

95. Dolbeer, Robert C. "Programmed Instruction for Prospective Teachers in Error-Detection Skill in Music Performance." Unpublished Doctor's dissertation, Ohio State University, 1969, as described by Dr. Dolbeer during a telephone conversation with the writer on April 9, 1970.

VITA

Robert Weatherly was born in Coffeyville, Kansas in 1921 and was graduated from Central High School in Tulsa, Oklahoma in 1938. After one year as a student at Oklahoma State University in Stillwater, he was awarded a full scholarship at the Juilliard School of Music in New York City, where he was a trumpet student of William Vacchiano, and was awarded the diploma in 1943. He was then appointed principal trumpet of the Radio City Music Hall Symphony Orchestra in New York City.

After over three years as principal trumpet with the U.S. Air Force Band in Washington, D.C., he became principal trumpet of the St. Louis Symphony Orchestra, remaining for 15 seasons.

He was graduated from the St. Louis Institute of Music with the Bachelor of Music Education degree in 1960, receiving the Master of Arts in Education degree from Washington University in St. Louis in 1961.

He has been Director of Bands at Southeastern Louisiana University in Hammond since 1961.

EXAMINATION AND THESIS REPORT

Candidate: Robert Weatherly

Major Field: Education

Title of Thesis: Increasing Prospective Teachers' Skills in Detection of Ensemble Performance-Deficiencies by Means of Recorded Musical Materials

Approved:

William M Smith
Major Professor and Chairman

Mary Goodrich
Dean of the Graduate School

EXAMINING COMMITTEE:

Robert B. Kay

Charlie W. Roberts, Jr.

Robert E. Shenbaugh

Fred M. Smith

J. Gremillion

Date of Examination:

April 13, 1971